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OF THE

AMERICAN PHILOSOPHICAL SOCIETY

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FOR PROMOTING USEFUL KNOWLEDGE

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THE AMERICAN PHILOSOPHICAL SOCIETY
PHILADELPHIA
1944

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CONTENTS

Page

No. 1. The Early History of Science and Learning in America

The American Philosophical Society and the World of Science (1768–1800) GILBERT CHINARD 1
Education and the American Philosophical Society MERLE M. ODGERS 12
Notes on Early American Work in Linguistics FRANKLIN EDGERTON 25
American Historiography: A Critical Analysis and a Program RICHARD H. SHRYOCK 35
Horatio Gates Spafford, Precursor of Bessemer JULIAN P. BOYD 47
The Early History of Political Economy in the United States FRANK A. FETTER 51
Contribution to the History of Physical Anthropology in the United States of America ALEŠ HRDLIČKA 61
American Georgian Architecture THOMAS JEFFERSON WERTENBAKER 65
Early American Studies of Mediterranean Archaeology WILLIAM B. DINSMOOR 70
Early American Painters in England A. HYATT MAYOR 105
Rafinesque's Publications from the Standpoint of World Botany E. D. MERRILL 110

No. 2. Symposium on Post-War Problems

America Enters the Scene GUY STANTON FORD 121
Social and Economic Implications of Freedom from Want of Food FRANK G. BOUDREAU 126
Problems of Post-War International Monetary Stabilization JOHN H. WILLIAMS 133
Some Thoughts on Post-War Planning ALEXANDER LOUDON 139
Money and Sovereignty ROBERT B. WARREN 147
The Small Nations in the Post-War World HALVDAN KOHT 152
Individual, Family, Population, and Race FRANZ BOAS 161
Some Implications of Population Change for Post-War Europe FRANK W. NOTESTEIN 165
Panama Canal Revenues and Finances EMORY R. JOHNSON 175
The Economics of Transition ALEXANDER LOVEDAY 189
The Problem of Self-Determinism OSKAR HALECKI 194

No. 3. Bicentennial of Thomas Jefferson

Introduction to the Jefferson Bicentennial Program EDWIN G. CONKLIN 199
What is Still Living in the Political Philosophy of Thomas Jefferson? CARL BECKER 201
Jefferson as a Lawyer ROLAND S. MORRIS 211
Thomas Jefferson—Farmer M. L. WILSON 216
Thomas Jefferson and the Classics LOUIS B. WRIGHT 223
Notes on Thomas Jefferson as a Natural Philosopher HARLOW SHAPLEY 234
Jefferson and the Arts FISKE KIMBALL 238
The Old Political Philosophy and the New JOHN DICKINSON 246
Jefferson and the American Philosophical Society GILBERT CHINARD 263
The Beginnings of the American Philosophical Society CARL VAN DOREN 277

No. 4 Symposium on the Organization, Direction, and Support of Research Page

The Advancement of Learning in the United States in the Post-War World JAMES B. CONANT . 291
The Organization, Direction, and Support of Research in the Physical Sciences HUGH S. TAYLOR 299
The Discovery and Interpretation of Biological Phenomena DETLEV W. BRONK . . 307
A Critique of Medical Research ALAN GREGG . . 313
Discussion on the Symposium "Organization, Direction, and Support of Research" KARL K DARROW . 321
Political Economy in the Modern State HAROLD A INNIS . 323
War and Historiography ROBERT LIVINGSTON SCHUYLER 342
Merchants of Light Scholarship in Arts and Letters MARJORIE H NICOLSON 352
War and Research in Social Science. ROY F NICHOLS . 361

No 5 Papers on Archaeology, Ecology, Ethnology, History, Paleontology, Physics, and Physiology

Entropy. KARL K DARROW . 365
The Correspondence between Constantine Samuel Rafinesque and Thomas Jefferson. EDWIN M BETTS . . 368
The Philosophical Meaning of the Copernican Revolution PHILIPP FRANK . 381
French Refugees of 1793 in Pennsylvania. ELSIE MURRAY . 387
Ben Franklin's Mortgage on the Daniel Boone Farm J BENNETT NOLAN 394
Wynicaco—A Choptank Indian Chief C A WESLAGER 398
An Inexhaustible Source of Linguistic Knowledge ARTHÈME DUTILLY 403
The Earliest Account of the Association of Human Artifacts with Fossil Mammals in North America M F ASHLEY MONTAGU and C BERNARD PETERSON 407
The Novel of Ninus and Semiramis DORO LEVI . 420
The Time Factor in Chromatophore Responses G H PARKER 429
Physiological Time P LECOMTE DU NOÜY . 435
Studies on the Army-Ant Behavior Pattern—Nomadism in the Swarm-Raider *Eciton burchelli* T C. SCHNEIRLA . . . 438
Index 459

16 FEB 1949

THE EARLY HISTORY OF SCIENCE AND LEARNING IN AMERICA

With Especial Reference to The Work of the American Philosophical Society During the Eighteenth and Nineteenth Centuries

Papers read before
The American Philosophical Society
Midwinter and Autumn Meetings, 1942

PHILADELPHIA
THE AMERICAN PHILOSOPHICAL SOCIETY
INDEPENDENCE SQUARE
1943

16 FEB 1949

THE AMERICAN PHILOSOPHICAL SOCIETY AND THE WORLD OF SCIENCE (1768–1800)

GILBERT CHINARD
Princeton University

(*Read February 14, 1942*)

IN a paper read before the Society on April 18, 1907, the late Dr. J. G. Rosengarten has already listed "The Early French Members of the American Philosophical Society" The title was far too modest, since the author had made a fairly complete survey of the French membership, from the beginnings of the Society to the date of his communication, and had even included the recently elected French Ambassador, Jean-Jules Jusserand As this study has appeared in the *Proceedings* (1908), and is easily accessible, it might seem that there was no need to do over again what had been done so well and so thoroughly It happens, however, that when this survey is compared with the minutes of the Society, the picture drawn by Dr. Rosengarten, complete as it seems to be at first, is revealed as one-sided and consequently misleading.

The fact is that, even during the early years of the Society, France was at no time treated as the most favored nation by our predecessors. The French scientists were far from being the only distinguished foreigners invited to join the Philosophical Society. Whatever may have been the feelings of gratitude for the assistance given by France during the War of Independence, the early members made it a point not to discriminate against or in favor of any particular nation Their interest was not limited or defined by political or sentimental consideration, but extended to the whole scientific world So evident became this characteristic of the Society during the first half century of its organized existence, that, as the investigation proceeded, it became necessary to broaden the scope of this survey by including, however sketchily, an outline of the early international activities of the American members during the second half of the eighteenth century [1]

This truly scientific spirit had long been established in Europe It was the spirit of the Royal Society It had been forcibly expressed at the end of the seventeenth century by good Abbé Longuerue, when he wrote to Turretin (January 13, 1694) "Soyez persuadé qu'on ne peut rien faire de bon dans les sciences que lorsque les savants se communiquent mutuellement leurs connoissances et que la république des lettres ne peut pas se passer de commerce non plus qu'une république politique" Throughout the eighteenth century, this feeling of reciprocity and solidarity had grown in such a way that this republic of the mind had really come into being, uniting the individual scientists, philosophers and men of letters as well as the scientific bodies of Europe into an entirely unofficial but very closely knit organization It is in a degree surprising, but very gratifying, to discover manifestations of the same spirit among the "natural philosophers," the scientists and the amateurs who, around 1768, consolidated two small and relatively unimportant local organizations in order to form the association which has become the present Society No fault would have been found with them if they had simply created a mutual admiration society, similar to so many provincial Academies of the time, and if they had been satisfied with local recruiting or at most with a purely American or continental membership This they did not choose to do. At one of the earliest meetings of the Society, in fact before

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[1] Material for this paper was obtained from (*a*) *The Early Proceedings of the American Philosophical Society . . compiled by one of the Secretaries, from the manuscript minutes of its meetings from 1744 to 1838;* (*b*) the first four volumes of the *Transactions*, published respectively in 1771, 1786, 1793 and 1799, (*c*) *An Historical Account of the Origin and Formation of the A P S* by Peter Stephen Du Ponceau with a Report of the Committee on the Date of the Foundation of the Society, Philadelphia, 1914, (*d*) the manuscript minutes of the Society. Most of the information was derived from this last source, as it soon appeared that the printed minutes had been arbitrarily abridged, particularly with reference to mention and communications concerning foreign members. There is also considerable difference between the lists of members as it can be compiled from the minutes and the same lists as they appear in the *Transactions* It was assumed, perhaps wrongly, that the lists provided by the *Transactions* were more reliable and probably represented, not simply philosophers who had been nominated, but those who had been really elected and had accepted their election.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 1, JULY, 1943

Linlithgow Library.
Imperial Agricultural Research Institute

the Society was truly organized they selected outstanding British and foreign members. Overlooking the aspersions cast upon the climate and the future of America by the great French naturalist, they elected M. Buffon, of Paris, and at the same meeting paid the same honor to Dr P Burgius, Professor of Natural History in Stockholm, Christian McGee, LL.D of Heidelberg, Dr Cullen of Edinburgh, not to speak of Dr. Sandiford of Barbados and Dr Warner of Antigua They were already in touch with other distinguished foreigners, as shown by a letter received from Dr Cirillo, of Naples, in which the Italian scientist expressed his thanks for being proposed for membership and appended a list of plants which could be acclimatized in America

The eagerness of the Society to do its part and to join the scientists of the world in a common effort, appears in a very striking manner in their observations of the "transit of Venus over the sun" As early as April 19, 1768, John Ewing had made a proposal with considerations worth recalling

> As Astronomy may be brought to a much greater Perfection than it has yet arrived at by a multiplicity of accurate observations made of this Transit in different parts of the World & composed together, I would hereby propose to this society that effectual Provision be made for taking the s^d observation in this City This is ye more necessary, as such another Opportunity will not be presented for more than a Century to come

After the observations had been made at a great expenditure of time and money, the committee in charge was instructed "to draw up an account of the Transits of Venus and Mercury to be communicated to the Astronomers in Europe, to be transmitted to Dr Franklin, as President" (Dec 15, 1769) It might be supposed that the worthy scientists were not entirely disinterested, since on April 20, 1770, power was given to the Curator to write to foreign members and others "to solicit assistance in completing the Museum" Nor were they entirely selfish they fully intended to repay in as large a measure as possible the gifts they might receive When it was contemplated to print the first volume of the *Transactions* including the observations on the transit as the main part, a list was immediately drawn of the foreign institutions to which the volume was to be presented. It included "the Philosophical Societies" of Stockholm, Upsal, Berlin, Gottingen, Petersburg, London, Edinburgh, Dublin, Berne, Paris, Bolonia, Turin, Florence, and the Universities of Oxford, Cambridge, Dublin, Edinburgh, Glasgow, St Andrews and Aberdeen That the members of the Society were fully aware that they had done the work well is revealed in the form letter accompanying the volume "The American Philosophical Society held at Philadelphia humbly desirous to coöperate with the Society in their laudable endeavors for the Advancement of useful knowledge, request ye learned and respectable Body to accept this volume as the first fruits of their labors in this new world" (May 15, 1772) At the end of the introductory matter was printed a list of the members of the Society, followed by a list of the "European members," twenty-one in all, representing besides England, Scotland and Ireland, Sweden with three members, Germany and Italy with one each and France with a single one who headed the list, "Monsieur Buffon of Paris"

In the following year were elected Baron de Khengstadt, Counsellor of State of the Empress of Russia Dr Le Roy, Vice Director of the Academy of the Sciences, Paris, Dr Torbern Bergman, Professor of Mathematics at Stockholm, and Dr Alex Small of London In 1774, Dr Benjamin Franklin sent a considerable number of books from Europe and mainly from France which had been obviously procured from the authors themselves, and soon after the following French scientists and philosophers were elected to membership Condorcet, Daubenton, Dubourg, Le Roux, Macquair, Abbé Raynal, Lavoisier, Rozier, all "of Paris"

One does not have to seek very far to discover the reason for this apparently sudden interest of the French in the American society To some extent, it was due to the impression made by the first volume of the *Transactions* widely distributed through Europe by Dr Franklin himself and by Filippo Mazzei, friend and neighbor of Jefferson and American agent in Europe, and more particularly in Italy. But it was mainly due to the influence and personality of Benjamin Franklin himself and to the desire, on the part of European scientists, to give some recognition to the Society of which he was president. We can even suspect that the lack of provincialism which distinguished the Society would be attributed to the man who as a scientist was a citizen of the world, and as a patriot one of the first American citizens.

With the War of Independence and the French Alliance, the relations with France grew closer. France was the first power to recognize the independence of the United States, and the first to send to Congress an accredited plenipotentiary The January meeting of 1779 had been postponed to some future date, "for some weighty reasons," which appear on another page of the minutes as "the calamities of war and the invasion of this city by the enemy" But on March 5, the meetings were revived and on April 16, 1779, His Excellency M Gérard was notified of his election The Society was very lavish in expressing its gratitude to the French envoy· sixteen dollars were voted "in favor of Mr Hilary Baker who wrote his Excellency's certificate of election," and twenty dollars for binding the volume of the *Transactions* Both were presented to the French plenipotentiary by Joseph Reed, "President of Pennsylvania and patron of the Society," and Gerard, quite appreciative of the honor, mentioned it in his dispatch to Vergennes on May 14, 1779

When the French envoy had to leave, at the end of the year, because of ill health, the Secretary was instructed to ask him to place in the hands of Monsieur Buffon a letter, the terms of which are well worth recalling under the present circumstances The members of the Society felt that they were unable to repay in kind the magnificent gift that Buffon had made them of his *Histoire Naturelle des Oiseaux,* with colored plates and elegantly bound Very modest in comparison was the single volume of the *Transactions* honestly but simply printed by William and Thomas Bradford at Philadelphia, but in time of war even the disinterested purposes of pure science have to yield to more pressing work Temporarily at least the war had to take precedence over philosophical research Yet, it is significant that even at that time, the Society reaffirmed its belief in the fundamental and universal value of science

> "The Society," they wrote, "has to lament that since the receipt of your books, our situation hath been such that the chief attention of those among our members, who might have contributed something towards the important work in which you are engaged, hath been necessarily called towards the Assistance of their country in the great struggle which she now sustains. But it is hoped the time is fast approaching (and that your valuable life may be prolonged to that time) when the re-establishment of general peace, shall leave the friends and Devotees of Science, on both sides of the Atlantic at full liberty to unite their efforts for the advancement of wisdom, virtue and humanity, unconfined to Sect or nation"

Thus was started a tradition of electing to membership in the Society the French envoys La Luzerne, Marbois, Ternant, Otto, Fauchet, Adet, which was interrupted only when political difficulties with France made it impossible to continue to grant such recognition To the French at home, the Society showed particular attention, sending an orrery to the King, through Barbé-Marbois, making comte de Vergennes a member at the time of the conclusion of the Treaty of peace, but significantly electing on the same day not only Marquis d'Angevilliers, who was in charge of the royal gardens, but also Count Campomanes and Mr John Hyacinth de Magellan of London As soon as conditions warranted, the Society had returned to the program formulated in the letter to Buffon, and resumed intercourse with all the nations of Europe, including Great Britain, without making any discrimination This will appear even more clearly if we now refer to the list of "Foreign Members elected since the publication of the first volume of the *Transactions,* viz since the 18th of January 1771," dated 1786 Long as it is, it has enough significance to warrant its being reprinted here

List of Foreign Members Elected since the 18th of January 1771

Monsieur le Marquis d'Angevilliers, of Paris, Dr Adams of Barbadoes, Lieut Stephen Adye, of the Royal Artillery Dr Forbern Bergman, Prof Math, Stockholm, Major Frederick F S de Brahm, Triers, His Excellency M J Peter Van Berckel, Minister Plenipotentiary from the United Provinces of the Netherlands, Frederick Eugene Francis Baron de Beelen Bertholf, Imperial Councellor of Commerce to the United States, Brussels Le Chevalier de Chastellux, Marshal of the Field in the Armies of France, Chevalier of the Royal Military Order of St Louis, and one of the forty members of the French Academy, Count de Campomanes, Fiscal of the Council of Castile, Dr. Adair Crawford, Physician to St Thomas's Hospital, London, Dr Coste, Rev Thomas Coombe, Ireland, Daniel Coxe, Esq, England Mr Peter Dollond, of London, Dr Andrew Duncan, of Edinburgh, Monsieur Daubenton, of the Royal Academy of Sciences at Paris, Monsieur Dubourg, of Paris, Chev Dannours, Consul of France for the Southern Department . Hon. John Ellis, Esq, of Jamaica Hon. Bryan Edwards, Esq, of Jamaica Le Marquis de la Fayette, Major General in the Armies of the United States of America, Abbé Fontana, Director of the Great Duke's Cabinet of Natural History . Rev. Thomas Gibbons, D D, of London, Count de Guichen, Lieut. Gen. in the French Army . . Hon Samuel Gustavus Baron Hermelin of Stockholm; William Herschell, Esq., F R S, of Bath, England.

Dr Hugh James, of Jamaica . Timothy Baron de Kleingstedt, Councellor of State to the Empress of Russia; Brigadier-General Thadeus Kosciuzko . Le Chev de la Luzerne; Monsieur Lavoisier, of the Academy of Sciences in Paris . Monsieur Barbé de Marbois, Intendant of St Domingo, Lord Mahone, Monsieur Macquer, of Paris, Samuel Moore, Esq, of London, Dr Benjamin Mosley, of Jamaica; Mr John Hyacinth de Magellan, F R S, and Member of several Academies, London; Christ Fred. Michaelis, M D, of Gottenburgh, Mr John Mandrillon, Merchant, Amsterdam . Rev Joseph Priestley, L.L D, F.R.S, of Birmingham, England, Rev Richard Price, D D, F R S, of London, Dr Percival, Prof Chym, Trinity College, Dublin, Mr William Parker, of London. . . . Monsieur le Roy, Vice-Director of the Academy of Sciences in Paris, Monsieur le Roux, Abbé Raynal; Abbé Rosier, of the Academy of Sciences in Lyons . . Monsieur Sue, Professor Royal of Anatomy, &c., at Paris, Monsieur Jean Baptiste Sue, Prof Surgery in Paris, Right Hon Earl of Stanhope; Mr Alexander Small, of London; Mr James Six of Canterbury, England Monsieur le Count de Vergennes, Minister of State for Foreign Affairs, France Fortunatus de Warris, Esq ; William Wright, M D, F R S., in the Parish of Trelawney, Jamaica.

Out of fifty-five foreign members elected during that period, the French scientists and philosophers accounted for nineteen, not an undue proportion considering the place then occupied by France in the world of science Very few names had been inserted out of purely political considerations. Neither Rochambeau nor de Grasse appear on the list military distinction, services rendered to the American cause, were evidently not considered as sufficient ground upon which to confer membership on a foreigner, outstanding as he may have been in non-philosophical fields, the only possible exception being Comte de Guichen. As for Lafayette and Chastellux, they could well be adjudged "philosophers" according to the definition of the time All in all, in spite of the war, the Society had succeeded in maintaining through these parlous years its high international and scientific standards

The same remark applies to the following period which covers the years between 1786 and 1793 Some of the names on the long list published in the third volume of the *Transactions* had obviously been selected on Franklin's recommendation, and among them, particularly La Rochefoucauld, who had translated the texts of the American State Constitutions. Cabanis, the adoptive son of Madame Helvétius, and Condorcet, who was a personal friend of the Doctor But on the very day they were elected, Castiglioni of Milan, R. Kirwan of London and James Beattie of Aberdeen had also been voted upon. On the other hand, one would vainly look for any name which might have been recommended by Franklin's successor in Paris, and it seems unlikely that, even after his return to the United States, Thomas Jefferson made any use of his influence to obtain such a recognition for his French friends Here again, the complete list of foreign members will prove of interest.

List of Foreign Members Elected since 1st January, 1786, up to 1793

James Anderson, M D, of Madrass, Count Paul Andreani, of Milan. Rev Samuel Beattie, D D, of Aberdeen, Prof Moral Philosophy, Robert Barclay, of London, Sir Joseph Banks Bart, P R S, of London, William Baker, of Herefordshire in England, Rev Thomas Barnes, of Manchester, in England, Dr Charles Blagden, of London, Sec.R S., Palisot de Beauvois, Member of the Academies of Arts and Sciences at Paris, and Cape François; Nicholas L. Burmann, M D, Prof Nat Hist. in Amsterdam The Marquis of Condorcet, Secretary perpetual of the Academy of Arts and Sciences at Paris, M Charles, of Paris, Lecturer in Experimental Philosophy and one of the first Aeronauts, Cabanis, M D, of Paris, Lorenz Crill, M D, of Helmstead in Brunswick, Count de Castillioni, of Milan; De Vaux Cadet, M Cadet, both of Paris, and members of several Academies in Europe, Hector St John de Crevecœur, Consul of France, at New York; Petrus Camper, of Friesland, F.R S, and member of Academies at Paris, Petersburg, and Edinburgh, Joseph Ceracchi, Statuary of Rome, M. Coupigny, of Cape François. . The Princess Catharine Romanowna Daschkaw, Chevaliere of the order of St Anne, Directress of the Imperial Academy of Arts and Sciences at Petersburg, and Maid of Honor to her Imperial Majesty; Erasmus Darwin, M D, F R.S, of Darby in England. M. Feutry, of Paris; Anthony Fothergill, M D., of Bath in England, Antoine, R.C M., de la Forest, Consul General of France, to the United States; John Reinhold Foster, of Halle in Saxony, and F R.S, of London. . Don Francis de Gardoqui, Auditor for the Rota, for the Crown of Castile at the Court of Rome; Gastilleir, M.D., of Montargis, M. Grivel, of Paris; Hubert de Garbier, M.D, of Paris, M M. de Granchain, Major General of the French Navy; Don Diego Gardoqui, Envoy from the Court of Spain, to the United States, Benjamin Gloxin, M D, of Colmar in Alsace; John Grosche, M.D., Prof Nat. Hist. in the University of Mittau, in Courtland. . Dr. Thomas Henry, of Manchester in England; John Hunter, of London, Surgeon; Baron de Hemitz, of Berlin, Minister of the Mineral Department, Baron de Hupsch, of Cologne. . . John Ingenhousz, M D, F R S, of Vienna, Physician to his Imperial Majesty Richard Kirwan, F R.S, of London . John Coakley Letsom, M D, and F R S, of London, John Lusac, of Leyden, Professor of Greek Andrew Murray, M D, Professor of Botany in the University of Gottingen. M Noel, M D., of Paris; Sir Edward Newenham, Bart, of Dublin . . Lewis William Otto, late Chargé des affaires of France, to the United States. Thomas Purcival, M.D, of Manchester in England, Thomas Pennant, of Flintshire, Peter Simon Pallas, M D, Professor of Nat. Hist at Petersburg The Duke of Richmond, of England, M. Alphonsus Le Roy, of the Academy of Arts and Sciences at Paris The Abbé de Soulavie, of Paris, George Spence, of Jamaica, M Stainsby, of Prague, Prof Nat Philosophy, Dr Andrew Sparrman, Prof Nat History and Botany, at Stockholm; Dugald Stewart, Prof Moral Philosophy, at Edinburgh Charles Peter Thunburg, Prof Nat History, at Upsal, Rev Uno. von Troil, Arch Bishop of Sweden . Samuel Vaughan, Jun of Jamaica, M Le Veillard, of Paris, Benjamin Vaughan, of London, George Vaux, Surgeon of London, Rodolph Valtravers, F R.S., Louis Valentin, M D, Cape François. . John Whithurst, F R.S London, Thomas White, of Manchester, England, Caleb Whitford, of London, John Walker, D D and M D, Prof Nat History in the University of Edinburgh

Out of sixty-nine foreign members elected between 1786 and 1793, twenty-one were French, eight lived in Germany, three in Sweden, three in Russia, three in Italy, two in Spain, one in Austria, and one in the Netherlands, while Great Britain could claim twenty-seven The intellectual life of the country had resumed its natural and traditional course: Great Britain was decidedly the most favored country, while France came a good second

With the French Revolution, the coming to the United States of many French refugees and émigrés, one might have expected a comparatively large increase in the French membership of the Society. A not inconsiderable number of them were men of distinction, and there were very few Frenchmen of the time who could not make some claim to the title of "philosophe." It does not appear, however, that the American members of the Society were ready to modify in any way their standard and their mode of recruiting the foreign members Some of the Frenchmen in Philadelphia like Du Ponceau, Moreau de Saint-Méry and even Paliset de Beauvois were already regular members of the Society and considered as residents of the United States The others were made welcome as individuals by members of the Society, but very few were invited to join. The last list that we shall examine appeared in the fourth volume of the *Transactions*, published in 1799. It is the shortest of all it includes only twenty-seven new foreign members in all, out of whom ten were French It must be noted, however, that during that same period the recruiting of new members had slackened considerably and that only thirty-two new American members had been elected Even a casual examination of the following list will give ample evidence that the fundamental policy of the Society towards foreign membership had not undergone any considerable change.

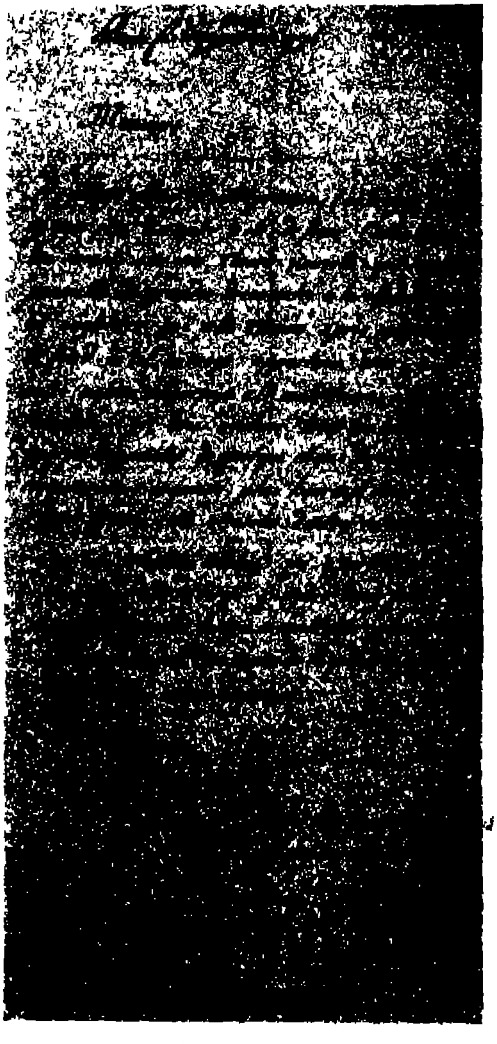
LIST OF FOREIGN MEMBERS ELECTED SINCE JANUARY 1, 1794, UP TO 1799

James Anderson, LL D, Scotland, M Adet. Paris, Earl of Buchan, P S S A, Scotland, John Frederick Blumenback, M D, F R S, Goettingen; Gustaf Von Carleson, Sweden, M F H Le Comte, Paris, Joanne Baptista Cuñat, Doctor of Civil Law, Valencia, Earl of Dundonald, Scotland, Louis Etienne Duhail, M D., France, Cypriano Riberio Friere, John Guillemard, A M, England, Jacques Marie le Fessier de Grandpré, A E Van Braam Houckgeest, Don Joseph de Jaudennes, Valencia; Alexander Lerebours, France, A. J Laroque, M. Mozard, France, Julien Niemcewicz, Poland, M. Talleyrand Perigord, France, M La Rochefoucauld Liancour, France; Edward Stevens, M D., F R S, St. Croix; James Edmund Smith, M D, F.R.S; J. B. Scandella M D, Venice, Don Luis de Urbina, Valencia, M. Volney, France, E. A. W Zimmerman, Brunswick, Francisco de Zach, Saxa Gotha

Membership in a foreign scientific society is too often regarded as a sort of exalted honorary degree, granted in recognition of work already done It is well known that "corresponding members" of academies seldom send any correspondence, and foreign members are even more reserved. Whatever may be the case in our days, the early foreign members of the American Philosophical Society considered themselves as "active" members and behaved accordingly The minutes of the Society contain long lists of gifts and books sent from abroad by newly elected members, by foreign academies and societies. Italy and Spain, Germany and Russia, Sweden and Holland, England and France contributed hundreds of precious volumes towards the library of the infant society.

Thus was established an almost regular system of intellectual exchanges between the old world and the new, such as perhaps does not exist now to the same extent between our Society and the older institutions of Europe For this remarkable, and for the time unique, achievement, credit is due to a few men who acted as collecting and distributing agents for the Society. Long before governments had thought of creating posts of "intellectual or cultural attachés," long before the Institut de Coopération Intellectuelle of the Society of Nations, these men, acting as individuals, wove across the ocean and all over Europe a real network of intellectual bonds First among them stands naturally Dr Franklin who, directly and through Mazzei, acted as the representative of the Society in Europe In a more subtle way, Mr Jefferson was equally active in behalf of his Philadelphia colleagues Marquis de Lafayette, always regarding himself as a sort of unofficial envoy of good will for the United States, urged his friends to present their works to the Society of which he was so proud of being a member Helping him in this self-appointed task was Benjamin D Warden, consul of the United States in Paris for so many years, under the Napoleonic regime Nor should François André Michaux be forgotten here, who, for almost thirty years, served without any compensation as the agent and representative of the Philosophical Society in Europe Thus was constituted a collection certainly unique in this country and perhaps unique in the world of presentation copies and of sets of scientific publications, too little known outside of the Society, and perhaps still imperfectly known to some of our members

In most cases, these gifts to the Society were accompanied by letters which the editor of our early *Proceedings* has often thought not important enough to warrant publication I am thinking particularly of one, simply listed as follows in the printed edition of Early Minutes (*Proc* 23, 88) "Opusc phys et chem 8° from Lavoisier, with a letter from the author " However, it happens that this letter is dated January 19, 1774, and that it contains not only a very generous and handsome tribute paid by Lavoisier to our Society, but what is undoubtedly more important, "the news of a new theory promising, as it seems, great discoveries in the field of chemistry," and granting credit for the "birth" of this theory to his English predecessors This is not the place to reopen an old controversy on the originality of some of Lavoisier's discoveries. It seems, however, that the document is so important and so full of the best scientific spirit, that I may be excused if I reproduce it here, as it was written by the "father of modern chemistry"



Paris ce 12 avril (19 Janvier) 1774

Messieurs

Mon objet en entreprenant l'ouvrage que je vous prie d'accepter a été de fixer l'attention des savants sur une Theorie nouvelle qui semble promettre de grandes decouvertes à la chimie, c'est en angleterre que cette Theorie a pris naissance le fond de cet ouvrage appartient donc a votre nation, heureux si contribuant à l'objet commun qui doit animer tous les Savants j'ai pu augmenter de quelque chose la masse des connoissances acquises, plus heureux encore d'avoir trouvé cette occasion d'entrer en correspondance avec une Société celebre qui a porté le flambeau de la verité jusques dans un nouveau monde et qui a contribué plus qu'aucune autre a etendre l'empire de la philosophie

Je suis avec Respect

Messieurs

Votre tres humble et tres obeissant serviteur

LAVOISIER

MM. de la Societé philosophique de philadelphie

Even before Lafayette had proclaimed the beginning of "the America era," philosophers, scientists and political writers saw, in the establishment of the Philosophical Society an opportunity to obtain authentic and reliable information on an immense portion of the globe still unexplored and largely unknown, but in which an unprecedented experiment was carried out by "philosophers" Thus, in 1774, Abbé Raynal, the famous author of the *Histoire Philosophique des Deux Indes*, wrote to the Society through Dr Franklin, proposing a number of queries "respecting the population, Commerce and Wealth of the American colonies." It is much to be regretted that "The Society taking the said queries into consideration agreed that they were not proper objects of the Society's inquiries, and desired one of the Secretaries to prepare a draught of a letter, to be sent to Dr Franklin, to inform him of the said Resolution of the Society"

A similar request from Marquis de Condorcet fared somewhat better The marquis wished to know, 1 Do the calcareous stones and the silex contain marine productions, or impressions of Shells or Fishes or Vegetables? 2 Are there any observations made in Philadelphia, or in the neighbouring colonies, on the direction of the magnetic needle? 3 Has the height of the Mercury in the barometer the same uniformity, with the changes of weather as on our Continent? 4 Whether there are in the English colonies negroes who, having obtained their liberty, have lived without mixing with the white people? 5 Whether there are in the plains or mountains of America stones owing their origin to volcanoes?

Foreign members in residence contributed several communications, some of which were printed in the *Transactions* Young Marquis de Lafayette, recently arrived from Paris, gave an account of the famous Mesmer and animal magnetism Chevalier de Chastellux urged M d'Aboville and Vergé, senior surgeon of the regiment of Auxonne, to forward to the Philosophical Society an account of a curious *lusus naturae, Two hearts found in one partridge*, a communication which takes a particular interest from the fact that it is dated "Williamsburgh, Feb 15, 1782" Young Otto, then an attache to the French legation, sent a long "Memoir on the Discovery of America" Among the refugees, most had come, in the words of Rittenhouse, because this country offered "an asylum to the good, to the persecuted and to the oppressed of other climes," but several were eager to continue their work Such was the case of the most famous of them, Priestley, who contributed several papers on the "phlogiston" to the fourth volume of the *Transactions* Palisot de Beauvois better known as a botanist, made a systematical study of the "amphibia" and serpents of North America

It must be admitted, however, that several of the refugees were somewhat disappointed in the limitations that the Society had seen fit to place upon its investigations There were wide differences of opinion between Moreau de Saint-Mery, former "procureur de la Commune de Paris," Talleyrand, the former bishop of Autun, the Duke of La Rochefoucauld-Liancourt, and Volney, the adoptive son of Madame Helvetius, but all of them were keenly interested in political matters and all of them had come to America with the hope that they could profit by the American experiment. Benjamin Franklin still stood in the memory of the French as one of the foremost philosophers of the century, the republican general, Washington, was a unique exemplar of civic and military virtue, Thomas Jefferson was the political philosopher par excellence These great men had close connections with the Society, and all three had labored to establish an unprecedented form of government It was naturally to be expected that the Philosophical Society would evidence an active interest in all matters pertaining to political and social problems As wrote Fauchet, then Consul General for the French Republic · "You could not formerly hold a commerce with us, but on Sciences not applicable to social principles, and We remained Infants in a study so important to human felicity, while you were already become men. We are now endeavouring to overtake our Friends; and the despotism exercised on the human mind, shall never more shackle our amiable and free communication with men who endeavor as much to soften, as to instruct themselves"

Even a rapid survey of the early *Proceedings* and *Transactions* would show that many of the problems which seemed so vital to the French members were on the contrary completely absent from the activities of the Society. La Rochefoucauld-Liancourt, to mention only one name, was too much of a gentleman to express openly his disappointment; he was much less reserved in his unpublished diary which I hope to make available soon to students of the period In France, critics were much more outspoken The third volume of the *Transactions* appeared in this country at the end of the fateful year 1793 and reached France in 1794. Millin, the editor-in-chief of the *Magasin Encyclopédique*, analyzed the volume in a 20-page review printed in the first issue of 1795 At the beginning, he frankly declared that the achievements of the Society did not correspond to the high expectations of people who were eagerly turning to America, as to the only nation capable of showing the way out of civil strife This volume, said Millin, in substance, contains valuable articles on many subjects, but, as an introduction, Nicholas Collin has published a list of the investigations to be undertaken in order to promote happiness in the country These investigations deal with several subjects, particularly medicine, rural economy, physics, mathematics, natural history, mineralogy; but no mention is made of a very important subject, namely population, public institutions, manners, customs, vital and human statistics, all topics "just as interesting as the reproduction of cryptogams discussed at length by Palisot de Beauvois in the volume"

In other words, the "humane interests," represented now by Class III and Class IV, did not seem to be sufficiently taken into consideration, and, as a straddler between Class III and Class IV, I am almost tempted to reëcho the complaint of the *Magasin Encyclopédique*, although much progress has been accomplished since the year 1793.

That such an omission, at least at that time, was deliberate, cannot be doubted The preface to the first volume of the *Transactions* is most emphatic on that point:

> Knowledge is of little use, when confined to mere speculation, but when speculative truths are reduced to practice, when theories grounded upon experiments, are applied to common purposes of life; and when, by these, agriculture is improved, trade enlarged, the arts of living made more easy and comfortable, and, of course, the increase and happiness of mankind promoted; knowledge then becomes really useful That this Society, therefore, may, in some degree, answer the ends of its institution, the members propose to confine their disquisitions, principally, to such subjects as tend to the improvement of their country, and the advancement of its interest and prosperity

The Charter granted on March 15, 1780, is no less specific:

> *Whereas* the cultivation of useful knowledge and the advancement of the liberal arts and sciences in any country, have the most direct tendency towards the improvement of agriculture, the enlargement of trade, the ease and comfort of life, the ornament of society, and the increase and happiness of mankind

Despite the tendency to broaden slightly the scope of the Society's interests, the fundamental agreement by which were merged the two societies constituting The American Philosophical Society for Promoting Useful Knowledge remained in force Article XII established six committees, namely. 1. Geography, Mathematics, Natural Philosophy and Astronomy; 2. Medicine and Anatomy; 3 Natural History and Chemistry; 4 Trade and Commerce; 5. Mechanics and Architecture; 6. Husbandry and American improvements. It is obvious that they did not embrace the whole field of useful knowledge and that the humanistic subjects had been left out.

The deficiencies to which the French members objected were met in part in 1800, probably under the inspiration of Volney Shortly before coming to America, he had been requested by the French government to establish a sort of questionnaire for the use of travellers and diplomatic representatives of the French Republic who, in foreign countries, enjoyed often long leisure and could usefully occupy their minds in the service of science Such questionnaires were not new, and many had been sent out under the old regime, but they were far less systematic than the set of questions designed by Volney and in general referred only to one point. In his introduction, Volney defined a much more ambitious purpose:

> Convinced that any truth, particularly in matter of government, is only the result of long experimentations, that is to say of many facts well ob-

served and judiciously put together, that what we may call principles of government are only summary of facts, or resumés of particular facts, finally that any good theory is only the formulation of good practice, the Ministry have decided to get together on the important science of political economy a mass of facts large enough to enable them to draw from their comparison either new truths, or the confirmation of recognized truths or even the refutation of accepted errors.

One of the "truths" to be so verified was "that for a long time it has been accepted that the physical geography of a country, its productions, the food consumed by its inhabitants, their occupations have a powerful influence on their habits, customs and character, and consequently upon the nature of the government and the laws" Such an investigation, enabling persons to reach a definite conclusion, would have consequences reaching the very foundation of all legislation Volney realized that such an undertaking would require years of painstaking study and could not easily be undertaken by an individual, although, during his stay in the United States, he made a good beginning It seems likely that during his investigation he communicated the questionnaire to his fellow-members of the Society However the case may be, when, in 1800, the government of the United States was about to take a census of the population, the American Philosophical Society took the initiative of petitioning "The Honourable Senate and House of Representatives of the United States," to the effect that the projected census should not be simply a record of the number of the population, but should also undertake to ascertain "the effect of the soil and climate of the United States on the inhabitants therof" "They flatter themselves," wrote the members of the Society, "that from these data truths will result very satisfactory to our citizens, that under the joint influence of the soil, climate and occupation, the duration of human life in this portion of the earth will be found at least equal to what it is in any other, and that its population increases with a rapidity unequalled in all others"

Whether or not the members of the Society had kept in mind Volney's questionnaire, there is little doubt that they had not forgotten the theory proposed years earlier by Buffon, according to which the climate of the United States was so unhealthy as to be practically unfit for human habitat

These reservations and differences of opinion did not affect in the slightest degree the friendly relations between the American Philosophical Societies and the French scientific societies When the Academies which had disappeared during the Revolution were reorganized and grouped together as the Institut de France, the first duty of the different sections was to select foreign associates Class II, now the Académie des Sciences morales et politiques, established a long list of candidates. Among them were such famous men as Rumford, Rennel, Dalrymple, Kant, Herder, Dugald Stuart, Ebeling, Arthur Young, Campomanes, David Ramsay, Niebuhr, Fox and Thomas Jefferson When the whole membership of the Institut selected by secret ballot the best candidate, Rennel received finally 157 votes, Rumford 169, and Thomas Jefferson, President of the United States and President of the American Philosophical Society, 264 votes It may be noted here that the Society did not return the compliment and did not elect Napoleon Bonaparte as a foreign member

With the beginning of the nineteenth century, I have to bring to a close this very rapid and very incomplete survey of the foreign activities of the Society In conclusion, I should like to call attention to one or two points which may serve to illustrate several distinctive features of the Society during its early years The first one is the wisdom displayed by the founders in restricting as they did the activities of the Society In doing so, they probably followed the example of the Royal Society, always considered by them as a parent society As Sprat, quoted by Lancelot Hogben, has pointed out (*Dangerous Thoughts*, New York, 1940, p. 75), there were "some Arts on which they have no mind to intrench as the Politicks, Morality, and Oratory because the reason, the Understanding, the tempers, the Will, the Passions of Men are so hard to be reduced to any certain observations of the senses and afford so much room to the observers to falsify and çounterfeit" In omitting all controversial matters which can arouse the old odium theologicum or odium politicum, our predecessors were aware that on that condition alone could harmony be maintained among the members of the Society No other body at the time could have united in a common purpose George Washington and John Adams, Thomas Jefferson and Alexander Hamilton. Through the Revolution and the troublous period which followed, the Philosophical Society managed not only to survive but to work usefully It succeeded in bringing together, as participants in the meetings, the diplomatic representatives of the French Republic and the men who had fled from France to escape prison and perhaps the guillotine. At all times the American "philosophers" held to the belief that science should remain above party strife and international quarrels Said their Charter: "And whereas nations truly civilized, however unhappily at variance on other accounts, never wage war with the arts and sciences and the common interests of humanity " What better confirmation that this was not an empty creed could be given than a single entry found on page xxxiv of the *Transactions* printed in 1799? It simply reads: "Donations: Dec 1, 1797, Donor, *Marquis* of *Cornwallis* Presents A Trigonometrical Survey of part of England"

This did not mean in any way that the halls of the Society had become a cloister and a refuge against the perturbations of the outside world From the very beginning, the founders developed a broad and generous conception of the part they had to play in the world of science Such was the program set up in the third volume of the *Transactions* to which Millin had taken exception

> Philosophers are citizens of the world, the fruits of their labours are freely distributed among all nations, what they sow is reaped by the antipodes, and blooms through future generations It is, however their duty to cultivate with peculiar attention those parts of science, which are most beneficial to that country in which Providence has appointed their earthly stations. Patriotic affections are in this, as in other instances, conducive to the general happiness of mankind, because we have the best means of investigating those objects, which are most interesting to us In the present circumstances of the United States some problems of natural philosophy are of peculiar importance, a survey of these may contribute to the most useful direction of our own inquiries, and those of our ingenious fellow citizens

In fact, the activities of the Society soon transcended the narrow program outlined at the origin These philosophers were intensely patriotic, and one of their ambitions was to claim for their country recognition in the world of science They fully meant to do their part and a little more than their part for many years they had received all their "sciences" from Europe; the time had come, not to become independent, but to repay their debt and in their turn to contribute to the development of knowledge This was beautifully expressed by Thomas Jefferson in a letter to Faujas-Saint-Fond, Director of the Paris Museum of Natural History Explaining the object of the Lewis expedition, Jefferson wrote: "Ce seroit un grand plaisir pour moi si ces voyages nous procuroient des matériaux propres à reculer les bornes de nos connoissances, et nous mettoient à même d'apporter à nos frères ainés en science un tribut de notre gratitude pour les lumières qu'ils nous communiquent depuis tant de siècles" (*Annales du Muséum National d'Histoire Naturelle,* Vol 5, 1804, p 316) As far as I know this letter has never been published in the original, but as it is impossible at the present time to ascertain whether the manuscript has been preserved in the Jefferson papers in the Congressional Library, the French translation will have to suffice Under it, however, the text of Jefferson can be easily detected

It might be also pointed out that hasty readers like Millin may have been deceived by the very titles of some of the communications printed in the *Transactions* Under apparently very technical titles, were sometimes expressed ideas widely departing from the program laid out by Collin One case in point will again be provided by Thomas Jefferson. His invention of a "mould board of least resistance" is well known and has often been mentioned It seems however that Jefferson's biographers, including myself, have failed to note the striking circumstances which accompanied the publication of the description of the mould board in the *Transactions* At the beginning of the year 1798, the United States were on the verge of war with France and the danger of a new war with England had not been much attenuated by the Jay treaty Whether Jefferson was or not a "friend of France" cannot be discussed here, but he certainly was a friend of peace In his eyes a war against either France or England at that time would have been a ruinous folly, and he neglected no occasion quietly to work for peace A letter from Sir John Sinclair, President of the Board of Agriculture of London, announcing the election of Jefferson to associate-membership on the board, gave the agricultural philosopher an opportunity to communicate his views to the public of both England and the United States and to enunciate, not only a generous and philosophical ideal of international morality, but also to suggest very practical means of enforcing this new code of morality It is to be found at the end of the "Description of a Mould-board," printed in the fourth volume of our *Transactions* and dated March 23, 1798. As far as I know, it has never been reprinted elsewhere. One passage at least, in which Jefferson recommended the use of what we now call the "economic sanctions," may perhaps be given here.

I am fixed in awe at the mighty conflict to which two great nations are advancing, and recoil with horror at the ferociousness of man. Will nations never devise a more rational umpire of differences than force? Are there no means of coercing injustice more gratifying to our nature than a waste of the blood of thousands, and the labour of millions of our fellow-creatures? We see numerous societies of men (the aboriginals of this country) living together without the acknowledgment of either law or magistracy. Yet they live in peace among themselves, and acts of violence and injury are as rare in their societies as in nations which keep the sword in perpetual activity. Public reproach, a refusal of common offices, interdiction of the commerce and comforts of society are found as effectual as the coarser instrument of force. Nations, like individuals, stand towards each other only in the relation of natural right. Might they not, like them, be peaceably punished for violence and wrong?

Let us hope that that law of nature which makes a virtuous conduct produce benefit, and vice loss, to the agent in the long run, which has sanctioned the common principle that honesty is the best policy, will in time influence the proceedings of nations as well as of individuals, and that we shall at length be sensible that war is an instrument entirely inefficient towards redressing wrong . . . A war would cost us more than would cut through the isthmus of Darien, and that of Suez might have been opened with what a single year has seen thrown away on the rock of Gibraltar. These truths are palpable and must in the progress of time have their influence on the minds and conduct of nations.

Thus, at the close of the century, appeared in the *Transactions* the outline of a plan to enforce permanent peace which was to be taken up one hundred and twenty years later, by another eminent member of the Society, Woodrow Wilson. It did not rest on the hypothesis of the natural goodness of man, but on the sole hope that after learning the hard way, some day, men would come to a realization of a well understood self-interest. No better answer could have been given to the French critics who had found fault with the narrowness of the Society's program of investigation. There is good reason to believe that this ideal of Jefferson was also the ideal of his colleagues of the American Philosophical Society: To quote a last time from him, what he said of himself in his letter to Sir John Sinclair and of the part he intended to play, could have been said of the Society as a whole: "Perhaps I may find opportunities of being useful to you as a centinel at an outpost, by conveying intelligence of whatever may occur here new and interesting to agriculture." Instead of "agriculture" let us read "scientific and useful knowledge" and we shall have a perfect definition of what they understood to be their function and duty. Amidst untold difficulties at the cost of heavy personal sacrifices, without neglecting their patriotic duties, they succeeded in keeping the philosopher's faith. A century and a half later, in a world no less torn by political convulsions and the "ferociousness" of some men, the words in which our predecessors summed up their work in a "Memorial to the Legislature of Pennsylvania," in the year 1800, may serve us as a program and an inspiration:

> Animated by a love of science, ambitious of attracting to America the esteem of the enlightened, and above all other motives, anxiously solicitous to develop, to improve, and to extend the yet dormant tho' boundless resources of our Country, the A. P. Society has unceasingly pursued the objects of its institution, amidst the desolations of war and the violence of political feuds, and while others have been exclusively engaged in personal pursuits, the time and property of its members have been cheerfully devoted to the advancement of science.

EDUCATION AND THE AMERICAN PHILOSOPHICAL SOCIETY

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(Read February 14, 1942)

THE whole structure of American education has become so large and cumbersome and its votaries have become so numerous that there is a feeling that education, like Wordsworth's world, is "too much with us" Especially is this true among older men who look back to a day when education was less complex and reserved for the few. Yet, despite its great proportions, one looks in vain for a well developed science of education, for research in education is still in its infancy In 1928 Frank Pierrepont Graves pointed out to the Society that "in these days of scientific investigation it seems unfortunate and inconsistent that education, the basal science through which an understanding of all other lines is advanced, should have received so little recognition as a field of research "[1]

It is only natural that an organization like the American Philosophical Society, so closely identified with the efforts of scholars to extend the limits of knowledge, should be interested in the dissemination of knowledge The importance of the entire educational structure cannot be overlooked, of course Nor has the Philosophical Society neglected it On April 16, 1813, for example, a communication from Timothy Alden to Burgess Allison was read and three weeks later reported upon This communication, now in the Society's collection of manuscripts, outlined "an original plan for exciting a laudable ambition in schools of learning" It was based upon the writer's experience in teaching young ladies He proposed a quarterly catalog of students with "honorary notices" of various sorts; he was opposed to rewards for distinguished work which "have their intended effect on a small number of pupils" while the rest despair of preeminence and may "devote less attention to their studies." "On my plan," he says, "every one is entitled to as many marks of distinction, as her merits dictate." It is to be noted that this forward-looking document was concerned with the education of women, and that it supports the modern effort to have each student realize his or her fullest possibilities

A quarter of a century later Robert M Patterson was thrilled to announce the use that the stylus and wax tablet of ancient Roman days had been put to in training the blind.[2] In later years the Society heard expositions "On the Coordination of the Various Methods of Expressing Thought as Applied to the System of Public School Instruction,"[3] on the work of the Wagner Free Institute of Science,[4] and on the relation of the American Council of Learned Societies to humanistic studies[5] In the days of university-extension courses, it heard R Meade Bache[6] attack a lecture by Professor Richard G Moulton of Cambridge, England, although the speaker made it clear that he had "no intention to depreciate the cause represented by the well-concerted effort of University-Extension teaching to disseminate knowledge heretofore confined to the comparatively few" At dinners one has listened to responses to the toasts, "the labors and achievements of great teachers in Science and Philosophy live after them"[7] and "Our Universities."[8]

At its Bicentennial Celebration in 1927 the Society was addressed by the president of one of our leading American universities on the topic "University education in the United States"[9] He reminded the Society that the purposes for which it was established were "closely related to the essential aims of our universities," that, unlike undergraduate departments the predominant interests of which are in the student, the university graduate school "is proud of its devotion to the subject matter of the studies which fall within its purview," that "the American university derives its most vital intellectual force from ideals which are most fully realized in the graduate school," and that as a nation we must be ready to meet the costs of higher learning or to suffer the tragedy resulting from condemning learning "to the hands of men of second and third rate caliber"

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[1] Graves, Frank Pierrepont. The present status of research in education. *Proc. Am. Philos. Soc.* 67 (2) 175-185, 1928.

[2] Patterson, Robert M., *Proc Am Philos Soc* 1 (7) 94, 1839

[3] Haupt, Lewis M., *Proc Am. Philos Soc* 18 (104). 348-351, 1879.

[4] Willcox, Joseph, *Proc. Am. Philos Soc.* 32 (143) 245-247, 1894

[5] Leland, Waldo G., *Proc Am. Philos Soc.* 71 (4) 179-189, 1932.

[6] Bache, R. Meade. A fragment of objectionable university-extension teaching. *Proc Am. Philos Soc.* 29 (135): 50-59, 1891

[7] Keane, John J., *Proc. Am. Philos. Soc.* 27 (131). 47-50, 1889.

[8] Lovett, Edgar Odell, *Proc Am. Philos. Soc.* 66 723-727, 1927

[9] Angell, James Rowland, *Proc. Am. Philos. Soc* 66 645-654, 1927.

Three years later the Society conducted a symposium on the outlook for higher education in the United States.[10] One speaker[11] referred to the great expansion that a half-century had seen. numerous research institutes, laboratories, and libraries had been established; learned societies and councils had become numerous; journals and university presses had provided new opportunities to publish results of research; and financial resources for the support of all these had enormously increased. A college president[12] spoke on the movement "making for higher standards of academic work" in undergraduate schools, of the greater attention being given to the quality of students, and of limitation of numbers through more careful selection, so that in many colleges "reducing" had become the new fashion. A third authority[13] pleaded that "the college become a place of learning, and not a place where the young are sent to be educated," and that faculties should be made "conscious that it was their principal business to make their subjects important as subjects of learning, rather than as materials for education." He confessed that he was "in need of being convinced that multiplying schools and prolonging the school age is a good means of securing the society so much desired"

Let us examine part of the record of the struggle made by popular education against obscurantism which has brought it to the point where many think it is a good thing that has been overdone. A century ago this Society listened to a communication on the nature of public instruction in Russia.[14] Two years ago, when it held a symposium on the totalitarian state, a scholar who had spent much time in the Union of Soviets and had also studied modern Germany and modern Italy reported on the principles of totalitarian education.[15] Near the beginning of the latter paper Dr. Woody says "In the light of history, principles of education are mutable, depending centrally on the constitution of the society itself, the prevailing notions of man's nature and status, and the accepted standard of values, they differ as these differ, change as these change"[16] Then Dr Woody shows the fearful man of the totalitarian state feeling relief when a leader strips him of responsibility, bending his energies to the leader's will,[17] and, as another observer puts it, welcoming manacles to prevent his hands from shaking

How different is a young democracy in its self-confidence, in its assurance that it can never become incapable of solving its problems, and in its slowly growing liberalism! The American republic in its early years was feeling its oats and eager to perpetuate itself Many felt that great times were ahead, and that education of a kind suited to it would direct its growth and secure popular support of representative government as nothing else could This was not merely a theory of Thomas Jefferson, who had written to James Madison from Paris in 1787· "Above all things, I hope the education of the common people will be attended to, convinced that on this good sense we may rely with the most security for the preservation of a due degree of liberty." This opinion must have been shared also by his fellow-members in the Philosophical Society, for on May 1, 1795, when seven prizes were offered for essays "on certain specific subjects of useful Knowledge," the premium of highest value, one hundred dollars, was set aside for the winning essay "on a system of liberal education & literary instruction, adapted to the genius of the government, & best calculated to promote the general welfare of the United States —Comprehending also, a plan for instituting & conducting public schools in this country on principles of the most extensive utility."[18] Papers were to be received up to January 1, 1797. Later that year it was decided that members should "have ample opportunity of estimating the comparative merits of the Essays."[19] Finally on December 15, 1797, the Society heard analyses of all the essays and decided that two were equally meritorious, and that the prize should be equally divided between their authors, the Reverend Samuel Knox of Bladensburg, Maryland, and Samuel H Smith of Philadelphia A committee was appointed to superintend the printing of these two essays

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[10] *Proc. Am. Philos Soc* 69 (5), 257-294, 1930.

[11] Flexner, Abraham, *Proc. Am. Philos. Soc.* 69 (5)· 257-269, 1930.

[12] Aydelotte, Frank, *Proc. Am. Philos. Soc.* 69 (5)· 271-280, 1930.

[13] Woodbridge, F. J E., *Proc. Am. Philos. Soc.* 69 (5): 281-294, 1930.

[14] Götz, Pierre de, *Proc. Am. Philos. Soc* 2 (19)· 88, 1841.

[15] Woody, Thomas, *Proc Am. Philos. Soc* 82 (1): 39-55, 1940.

[16] *Ibid.*, p. 39

[17] *Ibid.*, p. 55.

[18] Minutes of March 6, 1795, in *Proc. Am. Philos. Soc.* 22 (119): 229, 1885.

One piece opening with the line from Virgil's Messianic Eclogue about a golden race springing up throughout the world "was ordered to be returned to the care of Alex Moore, Tavernkeeper, at the corner of Chestnut and Fourth streets"; the golden premium had not been assigned to it. Since the name and address of each author was to be placed "in a sealed letter, only to be opened if successfull," the competing essays either lack names or carry pseudonyms Some of them at least have been preserved in the manuscript collection of the Society[20]

One person who submitted an essay and called himself "Academicus" said that he was not a competitor but wished to offer his "mite to the advancement to so important a cause" Perhaps, as man of affairs, he was a member of the Society who wished to remain anonymous His manuscript was hastily written, his obvious misspellings remained uncorrected, and he pleaded "hurry of business, arising from daily occupation" His plan was prefaced by a discussion of language study, especially of Latin "It must be granted, that it requires time to acquire a sufficient knowledge of the latin, so as to profite by it But while the pupil is doing this, he is at the same time acquiring also habits of industry and application, which may be of the greatest use to him through life; bringing forth, strengthening his mental faculties, by exercises best suited to their capacities, furnishing his mind with a stock of the most delicate, elegant, nervous, and even of the most sublime sentiments and laying a foundation for his further advances in useful and ornamental improvements . From two to four years, between the ages of ten, and sixteen, is a sufficient length of time, for any boy of moderate genious, to acquire a competent knowledge of the latin . . " It ought to be noted that this defense of the classics was in opposition to much of the liberal thought of the period.

"Academicus" proposed tax-supported "English schools" for the young children of the poor with boards of trustees to serve without compensation His plan provided for academies and "competent professors in the seven branches of literature," these being "the learned languages, logic, retoric, geography, Mathematics, natural and moral philosophy." The academies were to be financed by various types of taxes that at the time would probably have seemed complex and burdensome He entertained no doubt, of course, of the beneficence of education He concluded

> It is a matter of the highest impotence [*sic*] to a republican government to disseminate knowledge, and to keep the avenues of access to it open to all, and especially to the middle, or even lower class of people This is the class to which we are to look for improvement in arts and knowledge, and which cultivates learning to its own emolument and the advantage of others. And, as the wealth of a republic may be said to consist in the quantity of wisdom, and information its citizens are possessed of, it ought therefore to be always kept within their reach Whenever it becomes a monopoly in the hands of the rich, the liberties of the state become a boon to the highest bider.

Even more meager in treatment than the paper of "Academicus" is an anonymous essay "On Education in public schools" This offers little in the nature of a plan, but it does propose "one general national university, serving at once as a centre of assimilation and of union in our tastes, our dialects, our habits, and our ideas—unfortunately of themselves too much at variance, and intensed by a chimerical fondness for foreign ties ever hostile to each other"

This anonymous essay, which is made up almost entirely of philosophical discussion, is in contrast with the essay offered by "Hiram," who said in his letter accompanying it. "Any Gratuity ordered for the present and future Work if required will be thankfully Received" Hiram called his short proposals "A Plan for Establishing Schools etc. Advantageous to Masters and Scholars." Teachers were not going to suffer if "Hiram" could help it, for he aimed to provide them with pleasant rural retreats, each master to have "a Commodious lightsome School-house, with lodging Rooms, or apartments, in or convenient to said House, a Garden and some land to Graze Cattle on. If a Single Man, he can let his land. If he has a family, the land will be of great Benefit to him . . " He suggested a modified Lancastrianism by which older boys would assist the younger, the awarding of small premiums to "those who learn most and best," the grant of no vacations except in severe winter weather, and the use of a few textbooks including one in arithmetic written by "Hiram" himself.

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[19] *Ibid.*, June 16, 1797, p. 260.

[20] Hansen, Allen Oscar, *Liberalism and American education in the eighteenth century* (New York, 1926), p. 110: "Unfortunately these two are the only plans that now exist of the great number that were presented." This statement concerning the plans of Knox and Smith is one of the very few inaccuracies in an otherwise enlightening treatment of this interesting topic.

Another anonymous paper about "conducting a liberal education suited to the government of the United States; or to a republican constitution in general, and the best method of establishing country schools in Pennsylvania," has an interesting discussion of subjects and methods but offers no real scheme. The author's orthography is, if anything, worse than one usually encounters in manuscripts of this period. the language of the ancient Romans is spelled both "latin" and "lattin" within three lines. His statement, "I would recommend the study of things rather than words," reminds one strikingly of the language of the Will of Stephen Girard written three decades later. "I would have them taught facts and things, rather than words or signs" His philosophy of education is, of course, that of the liberal thinkers of the period, and he says in his essay "Besides we should examine the bad effects of Ignorance in a republic, the bad effects of its becoming too general would be very great, as the most ignorant are always the most tenacious of what little ideas, or notions, true or false, they have imbibed. and it is scarce possible by any reasoning or even by experiments exhibited to them to alter their oppinions . . . It is very evident that a more general diffusion of usefull knowledge, and wisdom is the most effectual way to banish this disagreeable, and untractable disposition, for if information, and mental abilities, were more upon a level, people would not differ so much in sentiment as they do."

Samuel Knox, who was given half the premium, was a Presbyterian minister from Scotland, where he had begun at the University of Glasgow to win prizes in Greek and Latin, the study of which he always defended. He had assumed a pastorate in Bladensburg, Maryland, in 1795, and was head of the Frederick Academy when his essay was published in 1799 under the title *An Essay on the Best System of Liberal Education, adopted to the genius of the government of the United States; comprehending also, an uniform, general plan for instituting and conducting public schools, in this country, on principles of the most extensive utility.*"[21] The United States, he says in this document of more than a hundred printed pages, has "a wide extent of territory, inhabited by citizens blending together almost all the various manners and customs of every country in Europe. Nothing then, surely, might be supposed to have a better effect towards harmonizing the whole . . than an *uniform system of national education* " This national system should be directed to "the improvement of the mind, and the attainment of those arts on which the welfare, prosperity and happiness of society depend " It is an integrated system that is proposed, "the elementary parts of education as well conducted as the most advanced." This last ideal of education in a democracy deserves more than passing notice. Chief Justice John Marshall even believed that however important the universities might be, the primary schools were "objects of deeper interest" Not for decades was a realization of the ideal of Marshall and Knox even approached

Knox's plan proposed primary or parish schools "at a suitable distance from each other and endowed with a few acres of land and a proper house sufficiently large to accommodate the teacher and the taught." A teacher for each 30 or 35 children was to provide training in fundamentals including English "In each of these schools, at least three promising boys, whose parents could not afford to educate them, should be admitted at the expense of the parish or township" These were to become teachers and thus the public was to pay some teacher-training costs The next stage of education was to be provided by county schools or academies, that is boarding schools for 200 or 250 boys between the ages of 12 and 15, of whom at least five were to pay no tuition They were to be taught Latin (with literal translations provided at first), Greek, French, mathematics, and elocution With uniform curricula and fees, state colleges for boys between 15 and 18 were to continue the subjects of the county academies and add moral and natural philosophy. These colleges were to award only the Bachelor of Arts degree. The national university, situated perhaps near the seat of the national government though preferably not in a big city, was to be provided for young men between 18 and 21, and was to offer the Master of Arts and the medical and law degrees A few were to be educated at public expense in both the state colleges and the national university. "The faculty of the National University should be an incorporated body, invested with proper authority to make laws and regulations respecting the government of the University and for preserving peace and order through all its departments. It would, however, seem adviseable that this learned body, as well as the professors in all the other seminaries, should be amenable to the Board of Education"

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[21] Baltimore, 1799.

Thus Knox's proposed national system of education, from one end to the other, was to be uniform and under federal control. Uniform textbooks were proposed with a printer in each state, and the beginnings of the modern university press seem to be suggested, not to mention such features as modern supervision, equalized salaries for staff members, and their promotion on the basis of merit His book is said to have had more than 250 subscribers, including George Washington

Samuel Harrison Smith had been graduated from the University of Pennsylvania at 15 and was only 25 when as a Philadelphia journalist he tied for the education prize offered by the Philosophical Society, of which he was a member and for a time one of the secretaries In the preface to his ninety-two-page essay, *Remarks on Education,*[13] he therefore "neither claims the reverence due to age, nor the respect attached to established reputation" Philosophy, which, he says, "is but another word for experience," claims part of the essay with a discussion of wisdom, virtue, and happiness in which he quotes Quintilian, Bacon, Montesquieu, Rousseau, and Locke

Smith was an enthusiastic supporter of the new beliefs in republicanism "Under a Republic, duly constructed, man feels as strong a bias to improvement, as under a despotism he feels an impulse to ignorance and depression" A republic must strive for an almost universal diffusion of knowledge, for an "enlightened nation is always most tenacious of its rights It is not the interest of such a society to perpetuate error; as it undoubtedly is the interest of many societies differently organized. . In a republic, the sources of happiness are open to all without injuring any If happiness be made at all to depend on the improvement of the mind, and the collision of mind with mind, the happiness of an individual will greatly depend upon the general diffusion of knowledge and a capacity to think and speak correctly"

Smith speculated on the desirability of giving men more time in which to think by diminishing the twelve-hour working day "One great objection," he says, "cannot be here overlooked; its discussion is highly important from its connection with numerous prejudices, and particularly with the passion of avarice It will be said that though refined happiness be intimately connected with virtue and knowledge, yet that this kind of happiness was never designed for the mass of any nation, as their subsistence depends entirely on labour, and the productiveness of labour depends on the time devoted to it.

"It only requires a zealous disposition to embrace *what ought to be,* instead of clinging to what is, to disarm this objection of all its force"

After all, ten hours may yield the results of twelve hours, "as there is a protraction of labour destructive of all energy" Besides, the "powers of machinery" will be of great assistance in man's improved status.

A nation, thought Smith, "cannot possibly be too enlightened," and in the education of its children must assume a control "independent of, and superior to, parental authority" He agreed with his fellow-essayist Knox, as well as with Quintilian and Milton, that public education, that is education in a school, was better than tutoring within the home "Society must establish the right to educate, and acknowledge the duty of having educated, all children A circumstance, so momentously important, must not be left to the negligence of individuals. It is believed, that this principle is recognized in almost all our state constitutions"

School attendance was to be compulsory for all males, the period of education to be from five to eighteen with its support derived from a property tax One class of primary school, providing instruction in reading, writing, and arithmetic principally, was to be for boys from five to ten. The second class of primary school for boys from ten to eighteen was to offer advanced work in these same subjects with such additions as history, geography, agriculture, mechanics, and the memorization of "the constitution, and the fundamental laws of the United States" How much academic freedom a primary school teacher might enjoy was fixed in Smith's scheme. "The most solemn attention must be paid to avoid instilling into the young mind any ideas or sentiments whose truth is not unequivocally established by the undissenting suffrage of the enlightened and virtuous part of mankind."

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[13] *Remarks on education illustrating the close connection between virtue and wisdom, to which is annexed a system of liberal education* Philadelphia, 1798.

Each primary school was to have 50 boys. One boy from the second class of each primary school was to be sent to college and supported there at public expense, the other students were to be maintained by their parents. Each college was to have 200 students, who would extend their knowledge of the subjects of the primary school "together with the cultivation of polite literature." Certain other studies were to be almost extracurricular in nature. Smith proposed that "an opportunity be furnished to those who have the ability, without interfering with the established studies, of acquiring a knowledge of the modern languages, music, drawing, dancing, and fencing; and that the permission to cultivate these accomplishments be held forth as the reward of diligence and talents."

The capstone of his educational structure was to be a national university "in which the highest branches of science and literature shall be taught." Its students were to be promoted from the colleges. One of each ten was to be chosen by his college professors and maintained at public expense on a salary at the university. A teaching hierarchy was to be set up. It was proposed "that the professors be in the first instance designated by law, that afterwards, in all cases of vacancy, the professors of the college chuse the preceptors of the primary schools, and that the professors of the University chuse the professors of the colleges."

And who were to select the university professors and have supreme control in this national, uniform system of education? This function was to be exercised by a co-optative board of fourteen savants serving with liberal salaries. Smith thought that it should "consist of fourteen persons skilled in the several branches of, 1 Languages 2. Mathematics 3 Geography and History 4. Natural Philosophy in general 5. Moral Philosophy 6 English Language, Belle Lettres, and Criticism 7. Agriculture 8 Manufactures 9 Government and Laws 10 Medicine 11 Theology. 12 Elements of taste, including principles of Music, Architecture, Gardening, Drawing, &c 13. Military Tactics. And in addition, 14. A person eminently skilled in Science, who shall be President of the Board." This designation of a scientist as president is of no small importance. The control to be vested in this board and the methods by which it was to encourage literature and science are suggested in the following paragraphs:

> It shall be the duty of this board to form a system of national education to be observed in the University, the colleges, and the primary schools, to chuse the professors of the University, to fix the salaries of the several officers, and to superintend the general interests of the institution.
>
> As merit and talents are best secured by liberal rewards, a fund shall be established and placed under the control of this board, out of which premiums shall be paid to such persons as shall, by their writings, excel in the treatment of the subjects proposed by the board for discussion, or such as shall make any valuable discovery.
>
> It shall further be the duty of this board to peruse all literary or scientific productions submitted to them by any citizen, and in case they shall pronounce any such work worthy of general perusal and calculated to extend the sphere of useful knowledge, it shall be printed at the public expence, and the author rewarded.
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> It shall be the especial duty of the board to determine what authors shall be read or studied in the several institutions, and at any time to substitute one author for another.

Smith felt that education, or the diffusion of knowledge, would secure for our nation "harmony at home and respect abroad." Should the forces of greed and prejudice that operate against "a liberal and just education" be permitted to triumph, we may see "gigantic power misapplied, towering ambition unsatiated with criminal gratification, avarice trampling poverty under foot." Enlightenment will bring about harmony and progress within our boundaries. And what of the world at large? Here Smith's nationalism, like that of so many of his contemporaries, broadens into a humanitarianism that considers the world its oyster.

> *Harmony at home must produce respect abroad.* For the aera is at hand when America may hold the tables of justice in her hand, and proclaim them to the unresisting observance of the civilized world. Her numbers and her wealth vie with each other in the rapidity of their increase. But the immutable wisdom of her institutions will have a more efficient moral influence, than her physical strength. Possessed of both she cannot fail to assume, without *competition, the station assigned her by an overruling power.*

The influence of the United States can be powerful. Americans will travel and carry with them wherever they go the spirit of philosophical research and of reform, a prophecy that most of our tourists have not carried out. Stimulating, indeed, is Smith's suggestion of the laudable example to be furnished by "the most powerful nation on earth, if that example exhibit dignity, humility and intelligence Scarcely a century can elapse, before the population of America will be equal, and her power superior, to that of Europe. Should the principles be then established, which have been contemplated, and the connection be demonstrated between human happiness and the peaceable enjoyment of industry and the indulgence of reflection, we may expect to see America too enlightened and virtuous to spread the horrors of war over the face of any country, and too magnanimous and powerful to suffer its existence where she can prevent it Let us, then, with rapture anticipate the aera, when the triumph of peace and the prevalence of virtue shall be rendered secure by the diffusion of useful knowledge"

Smith's essay does not discuss "female instruction," concerning which there was "diversity of opinion" He gave no strong support to either the classics or science, so that his plan suggests what used to be said of the degree of Bachelor of Science, that it did not guarantee that its holder knew any science but did guarantee that he knew no Latin or Greek The essay is, however, a striking piece of work for its insight and general breadth of view

Smith wrote to the Society on March 30, 1798, that his essay had "flowed from a conviction of the importance of the subject, and from a sense of the obligation such a conviction imposed on the citizen, to promote, by every effort in his power, an object of so interesting a nature. Still under the impression of this sentiment, and convinced how much I am indebted to your indulgence for the distinction you have conferred on my Essay by awarding it the premium, I request you to appropriate the amount of it to the advancement of the same object, in proposing a praemium of the value of Fifty Dollars, or by incorporating that sum with such other as the Society may devote to this purpose, should the offering a new premium be thought advisable" Smith's generous offer was accepted by the Society[33] The results had interested the Society so much that on January 19, 1798, soon after the award had been made, another committee had already been appointed "to consider the propriety of drafting an advertisement, offering again a Premium for the best essay on Public Education."[34]

A minute of February 15, 1799, records: "That a Premium of $100 be offered, with the usual conditions of secrecy &c. to the author of the best Dissertation upon the following question: 'How far is it the duty & interest of the Community, to provide for the Education of Youth?'—and that Essays on the Subject be received until March 1st, 1800" The whole matter was to be decided before the close of the summer of 1800, but the turn of the century brought with it an increasing number of scientific discussions and no further mention of the second contest is made in the minutes

The introduction to the published essays of Knox and Smith was written by Jonathan Williams, one of the secretaries of the Society It states quite frankly that in the eyes of the committee "none of the Systems of Education then under review appeared to them so well adapted to the present state of Society in this country, as could be wished" It is a little difficult to tell what the committee had in mind Possibly Knox and Smith were not sufficiently nationalistic, possibly they failed to give enough attention to education for citizenship in a republic and for comprehension of the problems of representative government.

The essays did, however, bring both Knox and Smith to the attention of Thomas Jefferson, who was President of the Philosophical Society at the time the award was made. Indeed, Jefferson's term as third President of the United States fell within his term as third President of this Society Knox was well thought of by Jefferson, and his *Essay* may have had some influence upon the latter when he was planning the University of Virginia. Indeed, the governing board of the Central College, the forerunner of the University of Virginia, had once decided to offer Knox its professorship of languages and belles-lettres. Smith became a literary satellite of Jefferson and supported everything that he proposed He had published Jeffersonian newspapers in Philadelphia as early as 1796, and one of these, the *Universal Gazette*, he continued in Washington after he had gone there on Jefferson's invitation. In 1800 he started a tri-weekly newspaper in the capital, the *National Intelligencer and Washington Advertiser*, which became the official organ of the Jeffersonians, published much that their leader wrote, and was allotted half of the congressional printing

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[33] Minutes of April 6, 1798, *Proc Am. Philos. Soc.* 22 (119): 269, 1885.

[34] Minutes of January 19, 1798; *id.*, p. 266.

It might be well to view these two schemes of Knox and Smith for a uniform and national system of education against the philosophy of Jefferson and others of the period. Despite the widespread feeling that education was a matter for the Church and for private interests to take care of, there was strong support for the liberal views advanced by Adam Smith in England and by Paine, whom Franklin had brought to the colonies as their semi-official pamphleteer, that education should be universal and provided by the State. In France Talleyrand held this view, and Condorcet asserted that the State must develop in each citizen "to the fullest extent the talents which he has received from nature." Malthus contended that an educated constituency would be able to resist demagogues

In his *Farewell Address* Washington said, "In proportion as the structure of a government gives force to public opinion, it is essential that public opinion should be enlightened." The nation's first Chief Justice, John Jay, considered "knowledge to be the soul of a Republic" and wrote in a letter to Dr. Benjamin Rush that education would reduce the number of weak and wicked citizens, who are, unfortunately, often in alliance John Adams argued that in expenditures for public education "the revenues of the State would be applied infinitely better . . . than even in maintaining the poor This would be the best way of preventing the existence of the poor" James Madison insisted that "a popular government without popular information or the means of acquiring it is but a prologue to a farce or a tragedy, or, perhaps, both." Madison felt that a satisfactory plan for primary education was "certainly a vital desideratum," but he also endorsed the pleas of many thinkers, including Monroe, Hamilton, and George Washington, that the federal government should establish a national university So strongly did Washington support this plan for a national institution of higher learning that in his will he left to the government a substantial sum as a nucleus for its endowment.

Jefferson felt that no nation could ever be both ignorant and free. With public education he would implement his civic oath: "I have sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man" That his opinions and those of the others who have been mentioned were far in advance of the thought of their times is proved by the fact that education is not mentioned in the Constitution of the United States and by the long delay in the establishment of state public school systems. The legislators of his own state, while he was its governor, rejected his plan as embodied in his "Bill for the More General Diffusion of Knowledge," introduced but a few years after he had written his more successful Declaration of Independence. During his Presidency, however, Jefferson saw free schools make a somewhat feeble beginning in Washington, placed his name on their first subscription list, and served on their first board of control.

Jefferson's unsuccessful plan for a state system of education in Virginia provided for the division of counties into such small areas that every child would have a school to attend At such elementary schools every free boy and girl was to receive free tuition for three years, after which they might continue "as much longer, at their private expense, as their parents, guardians, or friends shall think proper" The teacher's salary and other expenses were to be provided by the county Two or more counties were to join in support of a grammar or high school, and there were to be twenty of these in the state The capstone of the scheme was to be the enlarged College of William and Mary

Like Plato, Quintilian, and many other educational theorists, Jefferson subscribed to the so-called doctrine of individual differences, as his words rather vigorously reveal To him it was "expedient for promoting the publick happiness that those persons, whom nature hath endowed with genius and virtue, should be rendered by liberal education worthy to receive, and able to guard the sacred deposit of the rights and liberties of their fellow citizens, and that they should be called to that charge without regard to wealth, birth or other accidental condition or circumstance" Each year the best pupil in each elementary school was to be sent to a grammar or high school and retained there a year or two Only "the best genius of the whole" was to be continued for the full six years. "By this means," explained Jefferson, "twenty of the best geniuses shall be raked from the rubbish annually" Modern educators have tried to say the same thing less offensively by referring to selective admission systems, "college material," and "educability." Only half of those completing the grammar or high schools were to be sent on to William and Mary to be "educated, boarded, and clothed" for three years at public expense.

This is, of course, a highly selective system tending to set up an aristocracy of "genius and virtue," for Jefferson realized that although all men are created equal they do not possess equal capabilities. His system was designed to salvage the educable person and make something of him without being hamstrung by what one observer calls "pseudo-equalitarian and pseudo-democratic notions about education."[25] It suggests the type of educational selection that we have seen on the European continent. In fact, this same observer reminds us that Professor Gilbert Chinard, "who probably knows more about Mr. Jefferson than any one else in the country knows, thinks that his plan may have had a good deal to do with shaping the French system which, as you know, differs from ours in being rigidly selective."[26]

Jefferson's ideas about education were less nationalistic than one would expect. Certainly he longed for an educated citizenry, and he desired to see Americans pursue their higher education in this country in order not to have their Americanism corrupted.[27] But he never advocated a national university, so far as I know, and in at least his later years he developed sectional sympathies. In 1820 he rued the failure of his state to provide for its educational responsibilities and said that its paltry educational fare was "imported like beggars, from other states, or we import their beggars to bestow on us their miserable crumbs." In the next year the disturbing Missouri question caused him to warn against sending southern boys to northern colleges lest they receive some dangerous political indoctrination. Smith and Knox may have been more nationalistic than Jefferson and yet not sufficiently nationalistic to satisfy the committee that passed upon the essays. It is certain that they would not have satisfied the extremists who envisioned a new literature, a new art, and a new science, all distinctively American, and perhaps even a new language.

In his philosophy of education the young Smith was undoubtedly influenced by other members of the Society as well as by Jefferson. These men shared the liberal eighteenth-century doctrine of the perfectibility of man and of his institutions, the possibility of his indefinite progress, associated, to be sure, with Rousseau's principle of man's essential goodness. They gave much thought to the natural rights of man and to the necessity of change, flexibility, and experimentation in his institutions if he was to progress. With the French Abbé Raynal they saw the connection of the American Revolution with this current doctrine of the modifiability of governments and other institutions. The advance and strengthening of democracy seemed to them to depend on education. Like John Adams they felt that children must be "instructed in the principles of freedom." Many liberals thought that in the things which were basically American there must be no deviation from complete indoctrination, and that beyond these an objective, or as we say today a scientific, attitude should impartially evaluate everything that might lead to man's improvement.

All who held such views were part of the surge of revolt against mercantilism. To many Americans mercantilism meant England, and French thought offered doctrines that they could follow. The physiocrats led by Quesnay had many American sympathizers. French education was studied by Americans, including Jefferson himself, who had ample opportunity to become somewhat gallicized while serving as Minister to France from 1784 to 1789. The French Alliance had quite naturally increased American interest in everything French. In his *America and French Culture* Dr. Howard M. Jones cites the statement of B. A. Hinsdale: "Frenchmen saw in the United States a wide field for planting French science, art, and culture. It is scarcely an exaggeration to say that a propaganda was organized, or at least was on the point of organization in France, looking to that end."[28] Dr. Jones continues with a reference to one point of influence, the American learned society of which there were two types. One type, to which the American Philosophical Society belonged, "represented the English idea, modelling its organization on the Royal Society of Great Britain. The other, like The American Academy of Arts and Sciences of Boston, incorporated in 1780, was French in conception, and modelled itself upon the Royal Academy of Paris. Whereas the Academy published its *Memoirs*, the Philadelphia organization issued its *Philosophical Transactions*. Franklin was the progenitor of the one, and John Adams, returned from Paris, was the originator of the other. However, by an ironic reversal of fortune, the Boston group came in time to be thoroughly British, whereas the Philadelphia organization, as we have seen, admitted a number of French to membership, and was thoroughly in touch with French science."

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[25] Nock, Albert Jay. *The theory of education in the United States*, p. 151. New York, 1932.

[26] *Ibid.*, p. 32.

[27] In a letter to J. Banister, Jefferson wrote: "It appears to me, then, that an American coming to Europe for education, loses in his knowledge, in his morals, in his health, in his habits, and in his happiness." He once referred to "drinking, horse-racing, and boxing" as "the peculiarities of English education."

[28] Jones, Howard Mumford. *America and French culture 1750–1848*, p. 476. Chapel Hill, 1927. The quotation cited is from Hinsdale, B.A., "Notes on the history of foreign influences upon education in the United States," chapter XIII of the Report of the Commissioner of Education for the year 1897-98, vol. I (Washington, 1899), p. 597. On the next page Hinsdale points out that the name Germany does not occur in the indexes to Jefferson's works.

Indeed, the number of French members of this Society was rather large.[29] Three of these, Talleyrand, Condorcet, and Du Pont de Nemours should be mentioned in connection with our subject. In the last days of the National Assembly of France, Talleyrand presented to it in September, 1791, an education bill that recognized education as a responsibility of the government and proposed to make its elementary level free to all, while pre-professional or professional training was to be paid for except in the cases of a few scholarship holders. The national system of education was to have at its top a National Institute composed of distinguished scholars, who were to combine some teaching with their research. The National Assembly printed the bill and referred it to the Legislative Assembly.

Condorcet's report was submitted to the latter body in April, 1792, when France was bankrupt, threatened by foreign powers, and torn by internal dissension. It too provided wide opportunities for a small number of talented youths, with elementary training for practically all. It proposed to set up an educational hierarchy of the sort that Smith later included in his plan. This National Society of Arts and Sciences was to encourage research and the advancement of science and was to have charge of teacher-training, appointment of teachers, textbook selection, and school supervision. The expression of its intent in its first paragraphs is worth examination in view of the liberal educational philosophy of the period:

> To offer all individuals of the human race the means of providing for their wants, of insuring their welfare, of knowing and exercising their rights, of knowing and fulfilling their duties,
>
> To assure each one the opportunity of making himself more efficient in his industry, of making himself more capable of performing social functions to which he may be called, of developing to the fullest extent the talents which he has received from nature, and by that means to establish among the citizens an equality in fact, making real the political equality recognized by the law.

Daunou's Law of 1795 may have been more realistic than the unsuccessful proposals of Talleyrand and Condorcet, but it provided more generously for secondary and higher education than for universal primary education. Villages and the rural districts received no help, but special professional schools were set up and a National Institute of Arts and Sciences was to encourage research and publication.[30]

Du Pont de Nemours (1739–1817), whom Jefferson knew, gave up his profession of medicine when he became a follower of François Quesnay. He was secretary of the council of public instruction in Poland and rose to prominence in France after Turgot summoned him back to assist him. During his first period of exile in America, he accepted an invitation from Jefferson to write a plan of national education in the United States. At that time Jefferson probably knew that Du Pont would go further than he would himself in proposing a uniform, national system with a university at the top, but Jefferson had been influenced by Quesnay and the physiocrats. The plan,[31] published in 1800, urged national supervision of primary schools, secondary schools, and institutions of higher learning, including a national university known as the University of North America, to be located in Washington, and composed of a medical school, a school of mines, a school for social science and law, and one for "geometry and the sciences that it explains," in addition to a museum, a library, a botanical garden, quarters for a philosophical society, and the offices of the General Council of Education. This council was to have highly centralized control, and yet state committees of public instruction would maintain education on a democratic basis. Education was to be universal and accessible to all. It was to be free from the elementary school through the national university. Genius was to be encouraged. The whole system was to be constructed on the philosophy that, to promote human progress, institutions must be flexible and characterized by experimentation. Integration and experimentation must appear in the classroom work of even small children. Prizes should be offered for educational books. The plan is quite specific. It outlines the curriculum, lists the individual student's expenses, and estimates the cost of operating the national system in Virginia, Jefferson's state, as $76,500 per annum. It has been called a "Napoleonic dream"

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[29] Rosengarten, Joseph George. The early French members of the American Philosophical Society. *Proc. Am. Philos. Soc.* 46 (185) 87–93, 1907.

[30] Reisner, Edward H., *Nationalism and education since 1789* (New York, 1922) is valuable in a study of this period.

[31] Du Pont de Nemours, Pierre Samuel. *Sur l'éducation nationale dans les états-unis d'Amérique*. New York, 1800. There is a translation, *National education in the United States of America* from the second French edition of 1812, by Bessie Gardner Du Pont, Univ. of Delaware Press, 1923.

Certain it is, however, that in its early days our nation looked to France and borrowed much from her Until a century ago French textbooks in science and medicine were very common After visiting French schools, Thayer is said to have modelled West Point on the polytechnic school of Paris In higher education French influence continued, but in the general philosophy of education the excesses of the French Revolution caused France to lose ground, and they made many Americans either lose faith in democratic principles or feel more certain that they had to be protected with a universal education. James Sullivan, an important public figure in Massachusetts, felt certain that adequate education in democratic principles would have prevented revolutionary excesses[32] Sullivan, whose proposed method "of supplying Philadelphia with water from the falls of Schuylkill" had been presented to this Society in a letter,[33] desired education for citizenship that would foster intelligent public opinion free from religious and political dominance.[34]

Quite apart from French influence the roots of education in democratic principles had taken hold in the colonies Two Massachusetts Laws of 1642 and 1647 gave the Anglo-Saxon world its first legislation requiring that elementary instruction be given all children and that communities of at least fifty householders maintain schools. Here in Pennsylvania, as early as 1685, Thomas Budd, an English Quaker, had advocated compulsory public education for seven years "or longer, if the Parents please." Noah Webster a century later followed this tradition that was a product of the American soil. One critic calls him "a philosophical anarchist in his outlook," but says that his iconoclasm was scientific and constructive. He cried for divorce from Europe as a result of the French Revolution It seemed to him that nowhere in Europe could a free government develop. Tyranny in the past had debased too many Frenchmen Their dark ignorance had spelled the failure of a noble movement Webster developed a typically American interest in the Association of American Patriots for the Purpose of Forming a National Character. He wanted an American character that would be distinctive and eager to break "the tyranny of opinion and custom." He wanted "a body of creatively constructive citizens" who possessed a "scientific, objective, humanitarian attitude."[35] He urged "social experimentation," as did Nathaniel Chipman, a public figure in Vermont. Without experimentation and change, thought Chipman, men become as blindly smug as the Chinese in maintaining their custom of foot-binding[36]

Benjamin Rush, a much more active member of the Philosophical Society than Noah Webster, published in 1786 "a plan for the establishment of public schools and the diffusion of knowledge in Pennsylvania; to which are added, thoughts upon the mode of education proper in a republic, addressed to the legislature and citizens of the state." Franklin undoubtedly influenced him. Rush urged more attention to science and less to the classics. He wanted to see the American school curriculum adapted to American democracy, and so anxious was he to divorce American life from European traditions that with his tongue in his cheek he offered the suggestion that special schools for teaching the art of forgetting be established.[37] He believed that constant improvement could be obtained through experimentation. He felt that both sexes could profit by studying the principles of democracy, and his views on the education of women were far in advance of his time. The plan of education that he proposed for Pennsylvania, with one state university, four colleges, and free schools in every township, is somewhat suggestive of Jefferson's earlier proposals for Virginia.

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[32] Hansen, Allen Oscar *Liberalism and American education in the eighteenth century*, pp. 79–89. New York, 1926.

[33] Minutes of March 2, 1798, *Proc Am. Philos. Soc.* 22 (119) 268, 1885

[34] Stephen Girard, the French-born founder of Girard College, may have had a wealth of history and of political philosophy in mind when he wrote concerning the college in his famous Will "And especially I desire that, by every proper means, a pure attachment to our republican institutions, and to the sacred rights of conscience, as guaranteed by our happy constitutions, shall be formed and fostered in the minds of the scholars."

[35] Hansen, Allen Oscar. *Liberalism and American education in the eighteenth century*, pp. 200–255. New York, 1926.

[36] *Ibid.*, pp. 89–104.

[37] Rush, Benjamin. *Essays*, pp. 71–72. Philadelphia, 1798.

Wilmington, Delaware, produced Robert Coram, who in 1791 published there his *Political inquiries to which is added a plan for the general establishment of schools in the United States*. Criticizing the inadequacy of the schools of the day for producing intelligent citizenship and pleading for a tax-supported national system of education for everybody, Coram wrote the famous sentence that has in it the sledge-hammer blow of one of Paine's: "It is a shame, a scandal to civilized society, that part only of the citizens should be sent to colleges and universities to learn to cheat the rest of their liberties." Coram foresaw the failure of the American experiment if education for democracy were not provided.

Amable-Louis-Rose de Lafitte du Courteil foresaw its failure if equal opportunities for education were not available for the rural districts. He felt that industrialization would bring dependence upon Europe. This Frenchman, teaching in America, had, of course, been influenced by the agrarian movement in France. Lafitte's *Proposal to demonstrate the necessity of a national institution in the United States of America, for the education of children of both sexes*, was published in Philadelphia in 1797. It urged a tax-supported national system of liberal education for both sexes to be "under immediate direction of Congress."[38]

Most of the men who have been discussed in this paper were either members of the American Philosophical Society or were influenced by members. As Allen O. Hansen says, "There can be no doubt that the American Philosophical Society was one of the instruments that helped to give America the philosophy of the Revolution."[39]

If the philosophy of education preached by these liberals had prevailed, American history might have been changed to an extent difficult to imagine. We still have no uniform or national system of education, and the idea of a national university has been all but forgotten. Higher education prospered to a certain extent, the establishment of the University of North Carolina in 1795, for example, fulfilled the promise in the 1776 constitution of that state that "all useful learning shall be promoted in one or more universities." But the great system of public education in America did not develop for decades. Forward-looking intellectuals and some of the new forces, such as the Working Men's Committees of Philadelphia and elsewhere, favored the public schools, but a Philadelphia newspaper of July 10, 1830 (the *Philadelphia National Gazette*) represented much current opinion by arguing against them and stating that education "must cost to every one, time and money." It attacked the toast "Education and general information—these must indeed constitute our only true National Bulwark." But America never really lost sight of the necessity of education for democracy.

In the nineteenth century a great name associated both with the field of education and with the activities of the American Philosophical Society was its twelfth President, Alexander Dallas Bache. This Philadelphia-born great-grandson of Franklin had taught at West Point, had served in the army, had been professor of natural philosophy and chemistry at the University of Pennsylvania, and had been first president-elect of Girard College, and first president of the Central High School of Philadelphia, as well as first American superintendent of schools by the year 1843, when, at the age of 37, he left the field of education to become Superintendent of the United States Coast Survey. Since Bache was honored by this Society just a year ago in papers commemorating his life and work,[40] and some attention was given to his educational activities, including his monumental report on *Education in Europe*, written after a two-year tour of inspection sponsored by the trustees of Girard College,[41] I shall make no further mention of Bache other than to say that he urged an integration of all institutions in each community working for public enlightenment, the establishment of a national university, and a complete public school system supported by taxation. In 1856 Bache said of the public schools: "I feel a profound conviction that no substitute for these schools, adapted to the wants of society in the United States, can be found, and that they should be fostered and improved until they supersede all other establishments of their grade. Neither private education, nor that by associations, either religious or charitable, can take the place of general public education. Where the public schools are not as good as the private ones, these institutions have not supplied the want of which they are the index, and require further development. The public schools should be the best schools—the training in them the most thorough that can be had anywhere."[41]

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[38] Hansen, Allen Oscar. *Liberalism and American education in the eighteenth century*, pp. 168–176. New York, 1926.

[39] *Ibid.*, p. 109.

[40] *Proc. Am. Philos. Soc.* 84 (2): 125–186, 1941.

[41] Odgers, Merle M. Bache as an Educator. *Proc. Am. Philos. Soc.* 84 (2): 161–171, 1941.

From Franklin, its first president, to Bache, its twelfth, this Society gave America more than its quota of liberal thinkers. In the field of education, some of their thought has been blessed with meager fruition Federal control of education has been resisted in recent decades. The creation of a national university now seems more remote than it did a century and a half ago Education has become less, rather than more, uniform, and the desire for uniformity survives only in the thinking of some classicists or of President Hutchins and his followers and in such complaints as Walter Lippmann's that "there is nothing in particular that an educated man must know . . . no common faith, no common body of principle, no common body of knowledge, no common moral and intellectual discipline."

But this liberal thought of the eighteenth century prepared the ground for the vast system of public education that is one of the great achievements of our nation. Men of the eighteenth century dreamed of it. Bache in the nineteenth century saw it well upon its way The twentieth century, and perhaps the present decade, will probably put that system to a test of fire. We know, of course, that education is still in its infancy, despite its long history, and that we are in the position of alchemists, not knowing what the science of the future may be. In the expanse of human educability only a few areas have been worked. As more areas are staked out, the American Philosophical Society will doubtless play its part, as it has in the past, in "promoting useful knowledge."

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[41] Bache, Alexander Dallas *Anniversary address*. *October 28th, 1856*, p 9 New York, 1857

NOTES ON EARLY AMERICAN WORK IN LINGUISTICS

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DOWN to the beginning of the nineteenth century, what passed for linguistic science in Europe had suffered from two handicaps. On the one hand, it was based primarily on Latin, Greek, and to some extent Hebrew, and secondarily on modern European languages. Very little was known of other languages. On the other hand, it was abstract and speculative. Cogitation, and what passed for "logic," largely took the place of observation of real linguistic facts.

In the first part of the nineteenth century, the linguistic horizon began to be greatly extended. In the first place, historical and comparative language study, in the modern sense, grew out of the discovery of Sanskrit and through it of the Indo-European speech-unity and of the comparative method. Secondly, scholars began to learn something of many exotic languages, such as Chinese, Malayo-Polynesian, and American Indian. Thus doubts were raised as to the validity of earlier notions of "philosophical" grammar and supposed laws of language structure, which in fact were usually based chiefly on classical languages, or on nothing but fancy. The great German scholar Wilhelm von Humboldt[1] was one of the first to emphasize the necessity of profound practical knowledge of as many languages as possible, as a basis for linguistic generalizations. His point of view was shared by the best American linguists of his time, Pickering and Du Ponceau, who corresponded with him.

Practical difficulties, however, delayed for many decades the attainment of a sufficiently solid factual basis for a real science of language. Methods of field work were crude. Phonetics was in its infancy, grammatical and syntactic analysis was unconsciously based on adaptations of Latin grammar, even when applied to the native language of the investigator. Pickering and Du Ponceau, like von Humboldt and other European linguists, usually had little direct knowledge of the more exotic languages they dealt with, and they did not realize how naïve and imperfect were the materials furnished them by travelers and missionaries. Hence it is perhaps not strange that European works on general linguistics continued to be largely speculative, until well past the middle of the nineteenth century. It may be counted to the credit of American linguists that they did not participate much in such activities. The time was not ripe for them, the supply of factual data was not sufficiently extensive or reliable, and left too much room for guesswork, in which men are only too glad to indulge when not restrained by inconvenient facts.

The first American book on general linguistics, William Dwight Whitney's *Language and the Study of Language* (1867), may fairly be regarded as marking the dawn of a new era. It probably succeeded better than any earlier European book on the subject in basing itself on real linguistic data rather than abstract speculations. That its merits were appreciated outside of its own country is suggested by the fact that it was published first in England, and that after a few years it was translated into German (published 1874).

The subject of this paper will be "Notes" on American linguistic work down to about the middle of the nineteenth century, and I shall deal with Whitney only briefly in closing, since he belongs to the later period, which he introduced and for some decades dominated. It will be my object to emphasize early exemplifications of views and methods which commend themselves to scholars of the present day.

It seems proper to begin with English, the more so since that enables us to mention first what was apparently Benjamin Franklin's only published venture into the linguistic field. Franklin's "A Scheme for a New Alphabet and Reformed Mode of Spelling" was elaborated as early as 1768. He invented six new symbols, and proposed to use the traditional letters in a largely new and independent way. He wrote out in his system two passages of verse, of six lines each, and also wrote a single letter in it to an English correspondent, who opined (with how much justice our own generation knows well) that there would be "many inconveniences as well as difficulties" involved in getting the Franklin orthography adopted generally. Of this Franklin himself was quite aware; he commented, however, that these difficulties would only increase with the lapse of time, so that the sooner a reform was made, the less difficult it would be. Apparently he made no further efforts to introduce his system, which is interesting chiefly as evidence of Franklin's good sense in recognizing the absurdities of traditional English spelling.[2]

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[1] 1767–1835. See Theodor Benfey, *Geschichte der Sprachwissenschaft* 515 ff., 1869.

Many other proposals of "phonetic alphabets" followed.[3] One was made in 1786 by Noah Webster (1758–1843, elected to American Philosophical Society in 1827),[4] who corresponded about it with Franklin and received his general approval. He suggested that Franklin might use his influence to get Washington's support and then ask Congress to adopt it officially as the national orthography. Nothing came of all this, and later, in the preface to his dictionary of 1806 (p. vi), Webster[5] writes as if Franklin had tried to get him, Webster, to "prosecute his (Franklin's) scheme of a Reformed Alphabet; . . . I declined accepting his offer, on a full conviction of the utter impracticability as well as inutility of the scheme." As Krapp[6] observes with a touch of malice,

> Webster was above all a practical, not a theoretical reformer. Even while he was toying with the idea of a phonetic alphabet, he was engaged in preparing and advertising to the public his elementary books of instruction for which no sale could have been expected, had they made use of an invented phonetic alphabet.

Webster was a great but paradoxical figure. Sir James Murray called him "a born definer of words," putting his finger on his strongest point as a lexicographer. As Krapp[7] adds, in this part of his work "his Yankee ingenuity stood him in good stead. He was a good definer of words because he wanted to know about all things, not merely about them in general, but with the detailed knowledge which comes from taking ideas [read, 'the meanings of words'] apart and putting them together again." When Webster let his common sense and "Yankee ingenuity" guide him, he was sound and penetrating not only in lexicography but in grammar. As early as 1789, he saw that the grammarian's duty is "to find out what the language *is* and not how it *might have been made*",[8] a very modern-sounding dictum. He inveighed effectively against "mere Latin grammar very indifferently translated" as a substitute for realistic analysis of English grammar.[9] In 1798 he wrote that "the spoken language . . . is the only true foundation of grammar."[10] Yet he was capable of making lists of "the obvious errors which are found in the sacred writings and in the works of our best authors",[11] this was to him an important argument for the study of grammar, that it enabled one to improve the "bad grammar" of Shakespere, the King James Bible, Dryden, Pope, and Addison. He proves it by actually "correcting" all of these. And his own grammatical works do not suggest that he had learned to practice what he preached about the error of transferring to English the categories of Latin grammar.

In his greatest work, the ***American Dictionary of the English Language*** of 1828, Webster was particularly proud of his etymologies. He thought that all languages were derived from one primitive parent language, which he identified with the "Chaldee," meaning what we now call Biblical Aramaic. English etymologies based on this theory were retained in successive revisions of the Webster dictionary down to 1864, when they were at last eliminated by C. A. F. Mahn, a German scholar who was then put in charge of the etymological department of the work. Even the relative isolation of American scholarship from Europe hardly excuses such astounding ignorance in Webster, writing forty years after Sir William Jones, twenty after Schlegel, a dozen after Bopp, and half a dozen or more after the first volumes of Jacob Grimm,[12] any one of whom could have taught him the absurdity of deriving all languages from the "Chaldee."

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[2] See Krapp (1: 329 f.). Although peripheral to linguistics, this subject is related to it through its relation to developments in phonetics.

[3] Krapp (1: 330) lists nearly a score which appeared in the United States alone down to 1860.

[4] On Webster in general, see Krapp (*passim*), Mathews (especially ch. 4), and Shoemaker.

[5] "Somewhat disingenuously," as Krapp puts it (1: 333).

[6] 1: 332.

[7] 1: 367.

[8] Krapp (1: 11).

[9] Shoemaker (118).

[10] Shoemaker (129, n. 77).

[11] Shoemaker (123 ff.).

[12] On these and other pioneers in historical and comparative linguistics, see H. Pedersen, *Linguistic science in the nineteenth century* (transl. by J. W. Spargo): esp. 18 f., 37 ff., Cambridge, Mass., 1931. On Webster's etymologies, see Krapp (1: 363 ff.).

John Pickering, one of the two greatest general linguists of the first half of the nineteenth century in America, was born in Salem, Mass., on February 7, 1777, and died in Boston on May 5, 1846. He was elected to the American Philosophical Society in 1820 He won high distinction in his profession, that of the law, but his avocation was linguistics. His earliest publication in this field was *A Vocabulary, or Collection of Words and Phrases Which Have Been Supposed to Be Peculiar to the United States of America* (Boston, 1816), perhaps the earliest serious attempt at a scientific study of American English.[13] He was an excellent classical scholar, and prepared what has been called "the best Greek-English dictionary before Liddell and Scott "[14] In 1814 he declined the newly founded Eliot Professorship of Greek at Harvard (to which Edward Everett was then appointed), he had previously declined the professorship of Hebrew at the same institution Even while working on his Greek dictionary, Pickering found time to go deeply into American Indian Languages He reprinted John Eliot's *Indian Grammar* (1822), Jonathan Edwards, Jr.'s *Observations on the Language of the Muhhekaneew (Mohegan) Indians* (1823),[15] Roger Williams' *Key to the Indian Language* (1827), Josiah Cotton's *Vocabulary of the Massachusetts Indians* (1830), and Rasles's (or Râle's) *Dictionary of the Abnaki Language* (1833), all with linguistic notes and comments of his own He wrote the article on Indian languages of North America for the *Encyclopaedia Americana* (1831) Particularly interesting is his early *Essay on a Uniform Orthography for the Indian Languages of North America* (1820), which is nothing more nor less than a start towards an international phonetic alphabet It is, of course, crude and rudimentary when judged by modern standards. But it is highly creditable to Pickering that he saw what was needed. His alphabet was adopted by missionary societies, and it exerted an important and useful influence. In fairness to the author it should be emphasized that he did not expect his symbols to suffice for all, or even fully for any Indian languages. He hoped that it would be taken as basic for the "fundamental" sounds, and recommended that additions and diacritical marks be used as needed [16] He was merely making a praiseworthy attempt to introduce a minimal degree of order into the dreadful confusion which had prevailed up to then, and which still makes it so hard to know what sounds those early writers were trying to represent by the letters they used

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[13] *On other early work in this field, see Krapp, and especially* Mathews (*passim*) The recognized classic in the field is the *Dictionary of Americanisms* (1848) by John Russell Bartlett (1805–1886) Of interest to this Society is Mathews' chapter 9, which discusses, with abundant extracts, a series of articles on "Americanisms" published in the *Virginia Literary Museum*, beginning December 1829 They are signed "Wy," but according to Mathews are "supposed" (on what evidence we are not told) to have been written by Dr Robley Dunglison (1798–1869, elected to American Philosophical Society 1832), who was then at the University of Virginia but later lived in Philadelphia He was a secretary of the Society (1840–52) and a vice-president (1853–58). The articles contain much original material, chiefly based on the colloquial speech of Virginia and adjoining states, they supplement and correct the earlier work of Pickering, Webster, and others. Dunglison was a very distinguished medical writer and teacher, at one time dean of Jefferson Medical College, he was also actively interested in language and literature He was appointed by the Society to prepare the memoir on Du Ponceau which was presented after the latter's death on October 25, 1844

[14] *Dict. Am. Biog* 14 565 Work on the first edition (published in 1826) was begun in 1814, it was done with the collaboration of Daniel Oliver, of Dartmouth College It was primarily based on Schrevelius, but according to the preface "upwards of 2000 articles are either wholly new, or have new additions"; also "very numerous references to authors have been inserted " It filled a real need and was quickly sold out A second edition, prepared wholly by Pickering himself, was published in 1829; in it "more than 10,000 entire articles" were newly added It was later republished, with additions, in Edinburgh, "and, as it is said, was liberally used, with slender acknowledgments, in the preparation of similar works on that side of the water" (Prescott: 213). A third and last edition, revised by the author, appeared in 1846, the year of his death and several years after the first edition of Liddell and Scott (1843), which was frankly based on the German work of Passow (used also by Pickering in his third edition).

[15] Edwards (a son of the more celebrated divine of that name) learned this language thoroughly as a child in Stockbridge, Mass. His "Observations" were first published in 1788

[16] Pp 32–34 "But new signs should be introduced with the greatest caution, lest we should have an alphabet, which will be too cumbrous for use in writing, and will require a multitude of new types for printing, these languages The great danger will be (as Mr Du Ponceau has observed to me) that every man, however little qualified, 'will think himself adequate to the task of inventing new characters, and will delight to display himself in that way. These displays are used in order to conceal the want of ideas and resources ' As in the use of our own language, it is much easier for every tasteless writer to invent new words according to his own caprice in order to serve his immediate purpose, than patiently and carefully to select from our present abundant stock those appropriate terms, which have the sanction of the best usage, so, in constructing an alphabet for the Indian languages, it will be found a much shorter method, to devise new and grotesque characters, than to apply with skill and discrimination those letters which are already in use in our own or the kindred alphabets."

Pickering was a founder and the first president of the American Oriental Society, the organization of which in 1842 is an important landmark in American linguistics as well as in oriental studies His presidential address at its first annual meeting is a remarkable performance It is a very competent summary of current learning in all oriental fields, from Northern Africa to the Pacific Islands Its sources were almost wholly European, since this country then had virtually no original or creative scholarship in oriental fields. There was little more than some rather conventional Hebrew learning, chiefly associated with the training of clergymen [17]

Aside from Pickering, the important classical scholars of the day were men trained in Germany, or in a few cases natives of that country Their work is peripheral to my subject, since they were not linguists but philologists. That is, they were primarily interested in the literature and culture of the Greeks and Romans, and only secondarily in the languages, though of course they recognized them as necessary tools This was characteristic of German classical scholarship of the time, of which these young Americans were enthusiastic and influential exponents. I shall mention only George Ticknor (1791-1871, elected to American Philosophical Society 1828), George Bancroft (1800-1891, elected 1841), said to have been the first American to take the degree of Ph D in Germany,[18] and Edward Everett (1794-1865; elected 1831)

At least the equal of Pickering was Peter Stephen Du Ponceau (or Duponceau 1760-1844; elected to American Philosophical Society 1791, vice-president 1816-27, president 1828-44) These two men were certainly the outstanding general linguists of the first half of the nineteenth century in the United States Du Ponceau's biography and his work on American Indian languages were ably presented by Dr. Clark Wissler in his paper on "The American Indian and the American Philosophical Society" in the symposium of February 14, 1942, which has now been published, so that I need not dwell on them I shall speak chiefly of his work in other fields, some of it was of greater and more permanent value than his work on American Indian languages, which suffered from the handicap of being based almost wholly on the very imperfect records of others Du Ponceau had in fact little opportunity for first-hand factual observation of any of the exotic languages which were to him a major interest. But he had an exceptional native intelligence and scientific curiosity, wide learning for his time, and above all, extraordinary common sense It is this last faculty that impresses one most in his writing on linguistic subjects It appears already in his early monograph on "English Phonology,"[19] of which Krapp writes

> His purpose was to describe the sounds of the English language as those sounds actually impressed the ear, and to this end he endeavored to free the auditory impressions of the sounds as completely as possible from the visual images with which they are likely to be confused [even in dictionaries, as Du Ponceau clearly proved] through the influence of spelling and writing Though the effort cannot be said to have been completely successful the study is nevertheless notable as the work of one who realised the nature of correct method in the study of speech and who was himself a competent observer of wide experience.

Du Ponceau's realistic and sensible approach to linguistics is best exemplified in his most brilliant linguistic publication, the *Dissertation on the Nature and Character of the Chinese System of Writing*, published in 1838 as volume 2 of the *Transactions of the Historical and Literary Committee of the American Philosophical Society*. This ought to have been a truly epoch-making work. If it was not that, but remained relatively without influence (despite a long and laudatory review by his friend John Pickering in the *North American Review*, January 1839, 271 ff), this was due simply to the fact that it was too far ahead of its time Its thesis was that Chinese writing is not "ideographic" but "logographic" (as Du Ponceau first called it, in his letter of 1828, to Basil Hall, reproduced *Diss* 105 ff) or "lexigraphic," as he called it later in the *Dissertation* That is, each Chinese character represents not an "idea," and not a "thing" or a feature of the objective world, but simply a syllable, or a monosyllabic word, of the Chinese language There are still living today many Sinologists who cherish the traditional delusion that the signs represent abstract "ideas" Indeed it is only in very recent years that any considerable number of Sinologists have caught up with Du Ponceau. If he had had more direct knowledge of Chinese, his genius might have gone farther and seen the baselessness of the "monosyllabic myth" itself He did see (*Diss* 22) that Chinese has polysyllabic words, commonly called "compounds." It was doubtless only imperfect knowledge which prevented him from seeing the converse, namely, that many Chinese syllables, though represented, as all syllables are, by special separate characters, are not "words" at all, not "free forms", they cannot occur meaningfully in actual speech except in combination with other syllables.[20]

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[17] Prescott (219) attributes to Pickering, on the authority of Charles Sumner, the following linguistic attainments "It is certain that he was familiar with at least nine [languages],—the English, French, Portuguese, Italian, Spanish, German, Romaic [Modern Greek], Greek, and Latin, of these he spoke the first five He was less familiar though well acquainted, with the Dutch, Swedish, Danish, and Hebrew; and had explored with various degrees of care the Arabic, Turkish, Syriac, Persian, Coptic, Sanscrit, Chinese, Cochin-Chinese, Russian, Egyptian hieroglyphics, the Malay in several dialects, and particularly the Indian languages of America, and of the Polynesian Islands" A remarkable record, considering that he was also a busy practicing lawyer, served several terms in the Massachusetts State Senate, was City Solicitor of Boston from 1829 until a few months before his death, and served in 1833 on a committee of the legislature to revise the statutes of the Commonwealth

[18] Sihler (460). See Sihler, Sandys, and Wolff on these and other early classicists

[19] *Trans Am Philos Soc.* 1. 228 ff , 1818; see Krapp (2: 71 f)

As Pickering edited and published, or republished, the early works on American Indian languages by Eliot, Roger Williams, Rasles (or Râle), Cotton, and Edwards, so Du Ponceau also translated from the German and published in the *Transactions of the American Philosophical Society* (1830) the Delaware grammar of David Zeisberger (1721-1808), an early Moravian missionary, as well as certain works by Zeisberger's colleague John Heckewelder (1743–1823, elected to the American Philosophical Society 1797). Dr Wissler has dealt with Du Ponceau's Americanistic work, including the ambitious treatise on the languages of the American Indians which the French Academy published in 1838 ("Mémoire sur le système grammatical des langues de quelques nations indiennes .") Before leaving the subject, it seems worth while to note one permanent contribution to linguistic terminology which goes back to Du Ponceau He invented the term *polysynthetic*[21] to describe American Indian languages, many of which go very far in incorporating into a single word considerable numbers of morphological elements, as bound forms carrying both grammatical or relational and concrete or objective meanings. The term *polysynthetic* is still used very widely in referring to such languages all over the world

At least brief mention should be made of a few other early workers in American linguistics. I shall avoid so far as possible repetition of matters treated by Dr Wissler The distinguished physician and naturalist Benjamin Smith Barton (1766–1815, elected to American Philosophical Society 1789) published in 1798 his *New Views of the Origin of the Tribes and Nations of America*, arguing for the Asiatic origin of the Indians, and later in 1804 (*Trans Am Philos Soc*, o s, 6 145 ff) a brief letter containing etymological speculations, which seem only quaint today His "method and outlook" may have been "surprisingly modern"[22] in some respects, but linguistically he was naive, even for his day

Thomas Jefferson (1743-1826, elected to American Philosophical Society 1779, president 1797 1814) had a very live interest in Indian languages The library of the American Philosophical Society contains a few fragmentary manuscripts in Jefferson's own hand, apparently parts of a comparative study of several Indian languages. It also contains copies made by Du Ponceau of vocabularies of two Algonkian languages personally recorded by Jefferson These manuscripts were utilized and excerpted by Gallatin in his *Synopsis* (*q v*, p 36) In a letter of 1809[23] to B S. Barton, Jefferson states that for thirty years he had been collecting, from living informants, about fifty such vocabularies and had "digested most of them in collateral columns." The whole of this material was sent in a trunk from Washington to Monticello on his retirement from the Presidency But on the way the trunk was plundered by an unknown thief, who, doubtless disgusted at finding only papers of no value to him, threw all the manuscripts into the James River Sixty-eight pages, some damaged and fragmentary, were recovered and later presented by Jefferson to the library of the American Philosophical Society

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[20] See Y. R. Chao, *Harvard Jour. Asiatic Studies* 5. 189 ff , 1940; and for the baselessness of the traditional statement that the Chinese language is "monosyllabic," a highly important but still unpublished article (to appear in *Language*) by my colleague, George A. Kennedy, associate professor of the Chinese language and literature in Yale University

[21] First used in print in *Trans. Hist and Lit Comm A m Philos Soc.* 1: xxiii, 1819, two years before the earliest quotation (from a British writer) for the word with this meaning as given in the *NED* (Oxford). The *Century Dictionary* correctly ascribes the invention of the word to Du Ponceau, but without reference or date.

[22] Mitra (37)

[23] Quoted by Pilling (Bibliog Algonquian· 261, 1891).

The first comparative treatment of the languages of North America was made by Albert Gallatin (1761–1849, elected to American Philosophical Society 1791) in his "Synopsis of the Indian Tribes" of North America.[24] Not only did he use all material that had been printed, and a good deal in manuscript, notably from Du Ponceau's extensive collections, but also the U S Secretary of War, at his request, sent out a printed questionnaire containing a vocabulary of 600 words, selected sentences, and grammatical queries, which recipients were asked to answer The idea was a good one, though the returns seem to have been disappointingly meager "Considering the small amount of material at the time available, Mr. Gallatin's conclusions are sound and accurate "[25] Gallatin himself says (p. 4), and it seems with pretty good reason "I feel some confidence, that I have not been deceived by false etymologies, and that the errors, which may be discovered by further researches, will be found to consist in having considered as distinct families some which belong to the same stock, and not in having arranged as belonging to the same family any radically distinct languages forming separate families." As this suggests, sometimes "his praiseworthy caution prevented the grouping of languages which he felt morally certain belonged together "[26] Thus he left the Cherokee language as a separate family, although "inclined to the . opinion" that it belonged to the Iroquois family (p. 91), which is now known to be the truth. In 1842 Gallatin organized and became the first president of the American Ethnological Society, which greatly stimulated linguistic as well as other scientific work in the Americanist field

Henry Rowe Schoolcraft (1793–1864; elected to American Philosophical Society 1833) acquired an excellent knowledge of the language of the Chippewas or Ojibwas, partly from years spent in their midst, and partly from his wife, Jane Johnston, to whom it was a native language, she was part Ojibwa, a granddaughter of an Ojibwa chief His largest and most important work[27] contains various grammatical and lexical materials, especially in volume 5. I am indebted to my colleague Leonard Bloomfield, who knows Ojibwa well and speaks it fluently, for kindly making an examination of Schoolcraft's statements about that language. From this it appears that Schoolcraft unquestionably had a sound and thorough knowledge of the language, and in general analyzed its forms quite intelligently. His weakest point is his orthography, which is fatally inconsistent; he constantly represents the same sound by different letters, and vice versa. It seems never to have occurred to him that there would be advantages in settling on some one sign for each single sound and sticking to it The inconsistencies of English spelling may have helped to make this desideratum less obvious, although not only Du Ponceau (of French origin), but John Pickering, understood it, it is regrettable that both of them had to rely almost exclusively on records made by less clear-headed recorders.[28] The fact appears to be that all early records of Indian languages are so haphazard in their representations of sounds as to make their scientific use very difficult, unless by a person who has a good enough knowledge of the particular language in each case to be able to guess at what words are meant, no matter how grotesquely they are written. It is precisely in the field of phonetic accuracy that linguistic progress has been, perhaps, most revolutionary. Schoolcraft was no worse than most men of his time phonetically; and in depth of knowledge and analytical skill he was better than most There seems reason to believe that we owe to him a pair of linguistic terms which have passed into general scholarly use, *inclusive* and *exclusive*, as applied to first-person plural terms of reference.[29]

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[24] *Archaeologia Americana Trans, and Coll Am. Antiquarian Soc* 2, 1836.

[25] Goddard (558).

[26] Goddard (560)

[27] *Historical and statistical information respecting the history, condition and prospects of the Indian tribes of the United States* 6 v Philadelphia, 1851–1857

[28] Du Ponceau, in speaking primarily of English phonology (*Trans Am Philos. Soc* 1 228 f , 1818), has some very sensible and modern-sounding remarks: "Even among neighbouring nations . . . there are sounds apparently similar, which, however, are not so, being pronounced by a different juxtaposition of the organs of speech Yet they are in general considered alike, for no other reason, in most instances, than that they are represented by the same written sign or character, and that the difference is not easily perceptible to unexperienced ears. Such, for instance, are the sounds of the vowel *a* in the words *car*, *par*, which appear the same in the French and English languages, and which, however, an Englishman and a Frenchman do not pronounce alike. Hence we are told of the sound *a*, the sound *e*, the sound *o*, when in fact there are no such sounds in nature, *a*, *e*, and *o* being arbitrary signs, which may represent one sound as well as another, and are not always pronounced in the same manner [in English]."

Stephen Return Riggs (1812–1883), a Congregational missionary, spent many years working among the Dakota or Sioux, and acquired an excellent knowledge of their language. He began publishing translations and texts as early as 1842, and in 1851 the Smithsonian Institution published his *Grammar and Dictionary of the Dakota language*, the first extensive linguistic work in the field of Siouan languages. Two larger works by Riggs were published after his death in the series *Contributions to North American Ethnology*. volume 7, *Dakota-English and English-Dakota Dictionary* (1890), and volume 9, *Dakota Grammar, Texts and Ethnography* (1893).

One of Du Ponceau's merits was the stimulus and inspiration which he gave to correspondents all over the world. One of these was an American consular officer in French North Africa, William Brown Hodgson (1801–1871, elected to American Philosophical Society 1830).[30] Hodgson had a good knowledge of the classical languages and sound native judgment. He studied the Berber dialects of North Africa intelligently and fruitfully, with the encouragement of Du Ponceau, who caused his "Grammatical sketch and specimens of the Berber language" to be published in the *Transactions of the American Philosophical Society* (4 1–48, 1834, *cf.* Pickering, *Jour Am Oriental Soc* 1. 18 ff.) Hodgson was the first to propose and defend with reasonable arguments the Berber origin of the mountain-name *Atlas*[31]

In his presidential address at the first annual meeting of the American Oriental Society, John Pickering said (*Jour Am. Oriental Soc* 1 48) "The ancient college at New Haven is, I am informed, soon to have the advantage of the learning of a well educated Sanscrit scholar, as one of its professors." He referred to Edward Elbridge Salisbury (1814–1901), a graduate of Yale in 1832, who in 1841 (after studying with De Sacy and Garcin de Tassy in Paris and Bopp in Berlin) was appointed professor of Arabic and Sanskrit at Yale Before taking up the duties of the chair, he went abroad again and studied Sanskrit further with Lassen in Bonn and Burnouf in Paris, he actually began work at Yale in 1843 He was the first to hold a chair of Sanskrit in any American college or university, and he may be regarded as a link between the old and the modern periods Before him, most work in all linguistic fields in this country was done by men who were essentially amateurs, not professional scholars as we should now understand the term, although some of them were able, and a few, like Pickering and Du Ponceau, had touches of brilliance Salisbury himself did little scholarly work which we should now call strictly original But he had one advantage over Pickering and Du Ponceau he had actually studied with the best creative scholars of Germany and France This first-hand acquaintance with the latest and best European scholarship prepared him for the accomplishment of his greatest service to scholarship in this country, and it was great enough to assure him of permanent glory Namely, he launched James Hadley and William Dwight Whitney on their scholarly careers. They were his only intellectual children —but "two lions" [52] Salisbury was independently wealthy, and in 1854 he retired from the Sanskrit half of his professorship to enable his pupil Whitney (fresh from the completion of his studies in Germany) to assume its duties Not only that, but he gave Yale a substantial fund for permanent endowment of the chair Two years later, in 1856, he retired also from the Arabic chair, to spend the rest of his long life in the leisurely private pursuit of learning [53]

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[29] An *inclusive* 1 plural is a "we"-form which includes the person or persons addressed (= "you and I," possibly others also), an *exclusive* 1 plural is one which includes some third party or parties, but not the person or persons spoken to. *Many languages all over the world have this formal* distinction, and all linguists now know and use these terms. European linguists seem to have first met the formal distinction in the Malayo-Polynesian languages, where it is common. Thus Marsden (*Grammar of the Malayan language*. 45, 1812) notes two 1 plural pronouns, one of which "includes" and the other "excludes the party addressed," and W Mariner (*Account of the natives of the Tonga Islands*, ed 2, 2· [355, no page numbers printed after p. 344], 1818) notes two 1 plural pronouns, used "when the person spoken to is" and "is not included," respectively Others may, possibly, have used such descriptive terms as "inclusive" and "exclusive" plural, of Malayo-Polynesian forms, before Schoolcraft *I have not actually found them* before W. von Humboldt's posthumous work (he died in 1835) (*Über die Kawi-Sprache*, 2 38 ff , 1838), where occur the expressions "einschliessender" and "ausschliessender Plural " It seems, at any rate, certain that Schoolcraft was the first even to identify and clearly define the usage in any American language, viz in Ojibwa, in 1834 (*Narrative of an expedition through the Upper Mississippi* 173). For the description was quite new to Du Ponceau, who was extremely well read in the linguistic learning of the day. In his French Academy *Mémoire* (p 154, 1838) he speaks of *general* and *particular* plurals, adding· "M Schoolcraft croit qu'on doit dire le pluriel *inclusif* et le pluriel *exclusif*, mais cela nous paraît assez indifférent " For once Du Ponceau's insight failed him That it is not "indifferent" is shown by his own curiously confused and really meaningless attempt *to explain what he thought was the distinction* between the forms. The terms "general" and "particular," which Du Ponceau used and which he tells us were then in general use, simply make no sense as applied to these categories. (Humboldt, with his knowledge of Malayo-Polynesian, saw their real nature, but his publication was later than Schoolcraft's.)—It is curious that no English dictionary, not even the supplement to the *NED* (Oxford) or the latest *Webster's International*, contains the linguistic definitions of these words.

[30] He was not included in the *Dictionary of American Biography*, but, it is understood, will be in the first supplementary volume, planned to appear in 1943 See Cyrus Adler (*Jour. Am. Oriental Soc* 15, Proc. ccx f , 1893), and Leonard L. Mackall (*Georgia Hist Quart* 15 324 345, 1931) Hodgson became interested in oriental languages as a youth, and obtained appointment to various consular and diplomatic posts in North Africa, Turkey, and Egypt; in 1841–42 he was consul general at Tunis Most of his life after 1842 was spent in the United States, principally at Savannah, Ga. Besides the "Grammatical Sketch," he wrote *Notes on Northern Africa, the Sahara and Soudan* (New York, 1844) His collection of oriental books and manuscripts is now in the Telfair Academy of Arts and Sciences of Savannah The hall of the Georgia Historical Society at Savannah is named in his honor, it was presented after his death by his widow Appreciative references to his work on North African languages will be found in R. N Cust (*Sketch of the modern languages of Africa*, especially 1 101, 113 f , 1883)

[31] Modern Berber *adhrar* "mountain." The first *publication* of the identification of this word with *Atlas* seems to have been made by an English traveler named Washington in the *Journal of the Royal Geographic Society* (1· 140, 1830). But there the equation is merely stated baldly as an unsupported guess. Hodgson, actually in advance of Washington's publication (his communication is dated Algiers, 18 May, 1828, and was orally presented before the Society on October 2, 1829), collected much evidence for the etymology from both ancient writers and modern dialects with varying forms of the word, and presented the whole case intelligently and impressively No other origin of the name *Atlas* has ever been suggested with any shadow of plausibility Paully-Wissowa (*Realencyclopädie* 2. 2118 f., 1896) cite the equation, referring to Washington and later writers, but say nothing of Hodgson Hodgson suggested a number of other Berber etymologies for African names recorded in ancient writers, some of them are quite attractive.

James Hadley (1821-72) became professor of Greek Language and Literature at Yale in 1851, after his too early death he was described by Whitney as "America's best and soundest philologist" He was one of the first [54] classicists in America to make extensive use of Indo-European comparative grammar in working on the Greek and Latin languages. His scholarly activity hardly falls within the period covered by this paper

Neither does that of William Dwight Whitney (1827–1894, elected to American Philosophical Society 1863) For that reason I shall not attempt to describe his work as a whole But I think that my paper may fittingly close with a few remarks on "the greatest English-speaking student of general linguistics and the science of language," as he was properly called by Wolff [55] in 1921

His principal works on general linguistic science are *Language and the Study of Language. Twelve Lectures on the Principles of Linguistic Science* (London, 1867, New York, 1868), mentioned above, parts of *Oriental and Linguistic Studies* (2 volumes, New York, 1873 and 1874); and *The Life and Growth of Language, an Outline of Linguistic Science* (New York, 1882) The first of these was also the first work of its kind, that is, the first book on the general science of language, ever written in the United States In this country, therefore, there is no earlier work to compare it with But it stands comparison with earlier European works, in any language, extremely well It shows breadth and depth of learning worthy of the best of them; a seemingly easy control of the whole field, a masterly simplicity of presentation, and a plain, homespun, Yankee combination of shrewdness and sobriety, like that which Noah Webster showed in his best moments, but unfortunately did not always hold to Whitney reminds one at times of Benjamin Franklin, as it were in a somewhat Puritanized edition.

As I said at the beginning of this paper, one of Whitney's great merits is that, as compared with most earlier European writers on general linguistics, his treatment is relatively sober and factual in basis It may, however, be admitted that a contemporary linguistic scholar, especially one of the younger American school, will find in him some attitudes and methods which seem

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[52] Hopkins (13)

[53] That this did not mean idleness, nor merely desultory reading, is exemplified by the fact that he contributed 32 articles to the *Journal of the American Oriental Society* alone (Hopkins, 12)

[54] But not quite the first, who seems to have been Gessner Harrison (1807–62) of the University of Virginia, see Wolff (460)

[55] Page 467 On Whitney see the article in the *Dictionary of American Biography* (by H. H. Bender), *Journal of the American Oriental Society* (19, part 1 (Whitney Memorial Meeting)), Charles R. Lanman, "Brief sketch of Whitney's life," in the introduction to Whitney's posthumous translation of the Atharva-veda, Cambridge, 1905 (Harvard Oriental Series 7); and especially Ernst Windisch, *Geschichte der Sanskrit-Philologie* 2: 355 ff. (Berlin and Leipzig, 1920)

"dated."[56] This is neither surprising nor discreditable to him. Linguistics has made great strides in the seventy-five years since his first book on *Language* Let us remember that Whitney himself dominated the first part of this period and deserves a large share of credit for the advances Few other American scholars in any field of language or literature have exerted an influence as profound as his as teacher and fructifying writer

Moreover he achieved one supreme triumph, a book which it is hard to believe will ever be wholly out of date his *Sanskrit Grammar* First published in 1879, and virtually unchanged in later issues, it is still, after sixty-three years, unequalled in its field as a descriptive account of the language, at the same time compact and accurate, scientific and practical[57] It shows a positive genius for making hard things easy, complex things simple, and for separating first things from those that are subordinate, not omitting the latter, but including them in such a way that they do not impede by obstructing one's view of the things of prime importance[58] Whitney had the great good sense to attempt no historical or comparative treatment of the language If he had attempted it, his book would now be hardly usable, comparative Indo-European grammar has been revolutionized since the eighteen-seventies As it is, barring a few passages where, as if by accident, he refers to comparative or historical matters, there are not many places in the *Sanskrit Grammar* where one would wish a single sentence changed. It remains an all-time classic, an example of an almost perfect descriptive grammar of a literary language

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Here will be listed only works used extensively and referred to more than once in the course of my paper, the footnotes contain sufficient information about other works used occasionally Many other printed sources have been consulted, only those have been mentioned of which real use was made in preparing the paper

The nearest approach to a general treatment of my subject as a whole is Wolff It is an able and interesting chapter but necessarily extremely brief, since it includes literary as well as linguistic scholarship and covers the whole period down to its own date It has an important bibliography (pp 795 ff)

The *Dictionary of American Biography* presents biographies of nearly all the persons treated (I think William B Hodgson is the only exception), and some of them have been very useful

On the English language in America, Krapp is the standard work, and is excellent historically as well as otherwise Mathews supplements him usefully Shoemaker is good on Noah Webster's scholarly aspects

On early classicists Sihler and Sandys are less complete than Wolff (for example, they do not even mention Pickering)

On American Indian languages, Pilling's bibliographies are very complete to their dates, meticulously accurate, and invaluable for specialists They could be used by a good Americanist as a basis for a thorough historical study, which is much to be desired Most of the linguistically important works before the nineteenth century were published or republished by Du Ponceau or Pickering, Pilling has full information about all of them, and most of the bibliographical details are omitted here Goddard offers a useful though brief historical summary Mitra and Wissler are also helpful, though linguistics is only a minor part of the theme of both Professor Leonard Bloomfield, of Yale, and Professor C F Voegelin, of Indiana University, and Dr John R Swanton, of the Bureau of American Ethnology, have kindly given me valuable personal advice and assistance

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[56] Thus, at times he seems somewhat more influenced by the tradition of polite learning than we today expect a linguistic scientist to be His attitude towards "colloquialisms and vulgarisms, which ought to hide their heads in good English society" (*Language* 16) is not quite that of most contemporary linguists. Again, when he speculates on the reasons for linguistic processes, he sometimes seems to us teleological or mystical Even the *Sanskrit Grammar* (189a) contains one such phrase ("unless the proclivity is *satisfied* by the utterance of a lingual mute ") But in that book, at any rate, such expressions are extremely rare

[57] It received the compliment of being translated into German (by H Zimmer), the translation was published simultaneously with the original in 1879

[58] This task was complicated by the fact that Whitney, for the first time among Sanskrit grammarians, included a treatment of the preclassical (Vedic) dialect That is, he managed to cover two different dialects in one grammar, without the slightest confusion Yet there is not a single footnote in the book. Its chief external devices are two sizes of type, different enough to catch the eye but not enough to offend it, and the division into short, consecutively numbered sections, with even shorter lettered subdivisions.

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AMERICAN HISTORIOGRAPHY: A CRITICAL ANALYSIS AND A PROGRAM

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(*Read November 20, 1942*)

INTERPRETATIONS of the major American historians are available in biographies, in general studies by Bassett, Jameson, Kraus, and others, and in collections of critical essays[1] Additional works in the field are promised by Viola F Barnes, of Mount Holyoke College, and by W Stull Holt, of the University of Washington. The present purpose is not to repeat such detailed appraisals, but rather to analyze critically the motives, methods, and subject matter of the earlier and later writings as a whole This may provide a perspective on present historical activities, and some suggestions for the future Only writings on American history will be considered, and within this limit individual historians will be noted simply as illustrations of trends.

An historian's motives in writing usually reflect the intellectual atmosphere of his particular time and place But this truism calls for definitions. Both the terms "historian" and "place" have shifting meanings. Prior to the Revolution, for example, almost all who wrote on the past were considered historians. It is sometimes assumed that those Americans who published before 1750 were largely moved by religious purposes. Many authors displaying this theological orientation come to mind—Bradford, the Mathers, Prince, and so on. But this assumption involves a confusion in the concept of place. As there was then no such area as America in the present sense, there could be no such group as "early American historians" There were only historians of Massachusetts, of New York, and of Virginia The moment this distinction is made, it becomes apparent that only the first-named usually had religious objectives in mind. Most of them were clergymen. Their domination of intellectual life in New England provided a continuity and zeal in historiography which laid the basis of the later New England emphasis in our national traditions But it may also have delayed in that area the secular approach to history which was taken for granted by the physicians, planters, and schoolmasters who recorded the development of the Middle and Southern Colonies. Readers in the latter provinces were spared a chronology which began with the Garden of Eden

Many colonial writers claimed what is now termed a scientific objective, that is, they sought truth for its own sake The critical use of sources, accuracy, and a fairly balanced narrative were praised by Colonials as well as by later scientific generations.[2] They were also plainly moved by provincial enthusiasms The Mathers, for example, desired to praise the Lord but they also wished to magnify Massachusetts One hardly knows whether to admire or ridicule the pride which they and their fellow clergy took in the Wilderness Zion. Samuel Moody, in a contribution to juvenile literature published at Boston in 1714, declared to the children of that region "Poor hearts, You are going to Hell indeed, but will it not be a dreadful thing to go to Hell from New-England, from this land of light to that Dungeon of Eternal Darkness?"[3] One gathers that the transition would be less shocking to those for whom a residence elsewhere provided some sort of purgatorial preparation.

It is only fair to add that provincial pride was displayed in other colonies. Beverly and Byrd, for example, showed some feeling for Virginia. The problem of reconciling loyalties with objectivity does not seem to have worried most of these gentlemen unduly, but there were excep-

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[1] For the literature on American historical writings pertaining to this country, see Henry P Beers (ed.), *Bibliographies in American History*, revised ed (New York, 1942), under "historiography." An interesting collection of essays on the major historians of the past hundred years is Wm T. Hutchinson (ed), *The Marcus W. Jernegan Essays in American Historiography* (Chicago, 1937).

[2] One finds such aspirations, e. g , in William Stith, who published a history of Virginia in 1747; and in William Smith, who brought out a work on New York just a decade later. See Michael Kraus, *A History of American History* (New York, 1937), 92 ff.

[3] *Judas the Traitor Hung up in Chains*, etc.: 3.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 1, JULY, 1943

tions in this respect. Thomas Prince, despite his medieval time perspective, faced the question quite critically. "I have labored for accuracy," he declared, "and yet I dare not say, that I am without mistake." Admitting his devotion to Christianity and to religious liberty, he added: "I hope my inclination to these great principles will not bias me to a misrecital of facts, but rather to state them as I really find them for the public benefit."[4]

The last phrase suggests a goal that was in the minds of many eighteenth-century writers, namely, the improvement of personal and public conduct. The idea that history would influence the reader's character was part of the optimistic pattern of the Enlightenment, but is so obvious that it calls for no further comment here.

Closely associated with the objectives which these historians had in mind were their theories concerning historical forces or causation—what might be loosely termed their philosophy of history. If a man were a mere annalist, he might have no theory, but anyone tracing relationships required a frame of reference. Clerical scholars found this in their religious orientation. The statement that "God sifted a nation" in order to find settlers worthy of the Bay colonies illustrates this view. But New England scholars, as well as other Colonials, actually viewed the cultural heritage[5] as the major influence in American development. "Our fathers were Englishmen"—so runs a famous passage in Bradford. Even if God had ultimately guided the settlements, the medium of providential determination had been the transit of culture from the Old World to the New. Most Colonial writers, conversely, did not seem particularly impressed by environmental influences, save as obstacles to be overcome in planting English civilization on these shores.

Several early eighteenth-century authors, notably Colden of New York, Byrd of Virginia, and Douglas of Massachusetts, displayed a concern for imperial interests and so transcended provincial loyalties. This nascent imperialism, which reached its high point in Thomas Hutchinson, of Boston, was apparently nipped in the bud by the Revolution. Or perhaps one can say, rather, that it was grafted onto the stem of nationalism, which so flourished after 1783. That historical tradition was a prerequisite to national feeling, was as apparent to Americans as to any other people. Hence Revolutionary leaders in all parts of the country called for a history of the newly united States. The first step was the more systematic collection of materials, associated with such names as Jared Sparks and Peter Force—itself inspired in part by similar activities abroad. Finally there began to appear the national histories of Bancroft (1834) and Hildreth (1849), which dominated the field until nearly the end of the century.

This does not mean that other incentives to historical work were abandoned after 1800. As long as clergymen published, the religious objective was not entirely lost, although it was sometimes merged—as in Trumbull's work—with the patriotic. One of my own teachers, the Rev. Robert Ellis Thompson, of Philadelphia, produced a study with the suggestive title, *The Hand of God in American History*. But as clerical leadership declined, so declined a clerical orientation in historical work. Local loyalties also continued, after 1800, to inspire the publication of local and state histories, of which a few—like those of Gayarre on Louisiana—possessed distinct merit. But for patriotic and other reasons, such work was overshadowed by the national narratives.

One tribute, in passing, should be paid to the clergy of colonial New England. It was no accident, presumably, that both the outstanding national histories of the Middle Period were composed by Bostonians. It is sometimes held, therefore, that these men established a national outlook in the country as a whole. This is claiming too much, since Bancroft and Hildreth were clearly the products of a pre-existing nationalism which was just as typical of other parts of the country as it was of the Bay State. But they and literary colleagues like Longfellow encouraged a patriotic tradition, more than did the writers of any other section during the half century between 1840 and 1890. And their ability to do this apparently had its roots in the historical tradition long maintained by the clergymen of their section.

The nationalistic historians of the Middle Period cherished, in precept, the claim of objectivity. But it is well known that in practice

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[4] Thomas Prince, *Chronological History of New England in the Form of Annals* (Boston, 1826): xx, xxi.

[5] Using the term "culture" in its broadest or anthropological sense, to include technology, social relations, ideologies, etc.

Bancroft's work was as much colored by patriotism as Mather's ever was by piety. More than this, a varying degree of provincial enthusiasm—perhaps an unconscious one—survived in Yankee narratives and Yankee verse. Their authors were accused of making the most of New England. This was natural enough, and it may be that writers of other sections would have done the same sort of thing, had they exerted an equal influence. But none the less, the consequences must be considered. Certain assumptions which seeped into school texts and other histories still call for critical examination.

It is implied, for example, that New England Puritanism was *the* Puritanism of Colonial America, and that it passed thence into the main stream of our national life.[6] This apparently overlooks the fact that Puritanism, in a broad sense of the word, was just as typical of denominations like the Presbyterians, the Reformed Churches, the Baptists, and other English and German sects. There were puritanical elements even in the Lutheran and the Anglican traditions. These groups possessed far greater numbers and occupied larger areas than did the Congregationalists. Several of them centered, as far as there was any national focus, in Philadelphia. The Philadelphia Baptist Association, for example, reached from Virginia to Connecticut. No one has yet written a history of the expansion of Pennsylvania comparable to L. K. Mathew's *Expansion of New England*, but when this is done, we may have to retrace the lines of moral force across the map of the nation.

The failure of Philadelphians to portray the role of their region is in itself an interesting phenomenon. It suggests a lack of local or sectional consciousness, and the same thing may be said for the whole Middle Atlantic area. This is indeed the only section of the country which has no common historical tradition for the entire nineteenth-century period. The most specific indication of this is the fact that no one has ever published a general history of the region. One notices, also, that bibliographical works listing American sections often omit the Middle Atlantic area altogether for the period after 1800.[7] And the *Pennsylvania Magazine of History and Biography*, the oldest general historical journal in the country,[8] long seemed unaware that this state had any history after that date. If time permitted, it would be suggestive to explore the reasons for this unique neglect. Was it due to geographical and cultural diversity within the area? Or to national feeling so strong that it inhibited sectional consciousness? Or, perchance, just to Quaker modesty?[9]

Whatever the explanations, these did not apply to other sections. For after 1870, and particularly after 1900, provincial enthusiasms led to a veritable outburst of writings on the South and on the West. The former were clearly motivated by the regional consciousness associated with the Civil War. They did not claim all things for the South in the building of the nation, but strove rather to reestablish the historical position of that section. Very different, in this respect, was the rise of a Middle Western school. It is usually held that Frederick Jackson Turner, in elaborating the so-called frontier thesis during the 1890's, was partly motivated by his reaction against the New England tradition. He ended by doing, logically, just what the Bostonians had done; that is, he wrote the history of one section large across the national story. It was the West instead of points East which provided the great American epic for Turner. But there was the same soul-satisfying blend of provincial with national loyalties in each instance.[10]

In one respect, however, Turner differed essentially from his Yankee predecessors. He employed a different theory of historical forces. This does not mean that he was much concerned with an abstract philosophy of history—few Americans were—but he shifted the emphasis from a cultural to an environmental interpretation. The fact that neither Turner nor most of his students recognized that their views approached environmental determinism, does not invalidate this conclusion.[11] In his famous essay of 1893,[12] he held that the most significant American developments had been primarily influenced by an environmental complex associated with his concepts of isolation, free land, and "the frontier." Curiously enough, this interpretation may itself be viewed as an evidence of the cultural heritage it tended to minimize, since it was apparently stimulated by the work of such scholars as Buckle and Ratzel in the Old World, and by the consequent development of geographical interests in this country.[13]

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[6] See, e. g., Perry Miller, *The New England Mind* (New York, 1939), viii, ix.

[7] This is true, for example, of two works cited above, i. e., Beers and Kraus.

[8] Julian P. Boyd, "State and Local Historical Societies in the United States" (*Am. Hist. Rev.* 40: 10 ff., 1934), describes an important aspect of this whole theme, but space will not permit of its discussion here.

[9] Richard H. Shryock, "Historical Traditions in the Middle Atlantic Area," *Pennsylvania Mag. Hist. and Biog.* 67: 115 ff., 1943.

[10] See, for a systematic criticism of Turner, the essays by G. W. Pierson in the *Pennsylvania Mag. Hist. and Biog.* 64: 449 ff., 1940, and in the *New England Quart.* 15: 224 ff., 1942.

[11] Turner himself rarely seemed aware that his views approached environmental determinism. In a recent discussion of the significance of the Great Plains by two

Logically, after both the cultural and environmental interpretations had been exploited by historians, there remained only one other possible approach. A major influence in America could conceivably have been of a racial, that is, of a biological character. This view was clearly enunciated by Southern physicians and anthropologists as a part of the pro-slavery argument between 1840 and 1860, and certain Northern scientists like Samuel G Morton shared their interest [14] Their main point was that the Negro was inherently inferior, and that this fact had determined the course of his history in Africa and in America. His race had evidently stemmed from a separate creation Conversely, it was implied that Europeans—and particularly North Europeans—were a superior people This brief excursion into a biological interpretation of history was checked by the abolition of slavery, which removed its motive, and by the Darwinian denial of a separate creation, which demolished its scientific basis Its subsequent elaboration in Europe is another story

Note, in passing, that the interpretation of American development by physicians or anthropologists has usually been ignored in reviews of our historiography, for the denotation of "historian" was beginning to narrow, after 1800, to those who wrote on broad themes and established a literary reputation The medical group, which had produced such well-known eighteenth-century histories as those of Colden, Douglas, and Ramsay, was passing out of the professional picture at about the same time as were the clergymen Another consequence of this was that writings on such special phases of history as the medical have likewise been overlooked. Both Benjamin Rush and David Ramsay, for example, published about 1800 rather suggestive essays on medical history,[15] but these are rarely if ever mentioned in current works. Perhaps there were similarly obscure publications on such other matters as law, music, architecture, and so on, which are now recalled only by specialists

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One could go on here to a discussion of motivation among the later or scientific historians, who returned from German seminars after 1870, and who were responsible for creating an historical profession in the universities thereafter. But this story, though most important, can be summed up in a few sentences for the present purpose In practice the "scientific" writers had some claim to that adjective, because they were more devoted to the goal of accuracy than had been any earlier group. Nevertheless their purpose here was the same as that of various writers in the eighteenth century; the difference was one of the degree to which the common goal was attained

Even in this matter of realizing objectivity, moreover, scientific historians shared some of the limitations of earlier schools Despite all the desire for detachment, their writings continued to be colored by subjective factors. It has already been suggested that Turner—who belonged to the later group—expressed provincial feeling. It has been said that Channing could never get over his New England background And McMaster, while he transcended provincialism—as did most of the later Middle States scholars—was plainly an imperialist.[16] Their subjectivism was more sophisticated than that of early theologians and patriots, as was to be

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able western historians, there was no clear recognition that this was only a particular question within the major problem of environmentalism. The fact was later pointed out by Read Bain, a sociologist See Fred A. Shannon, "An Appraisal of Walter Prescott Webb's *The Great Plains*," *Critiques of Research in the Social Sciences* 3 (Social Science Research Council, New York, 1940)· 223, 224

[12] Frederick Jackson Turner, "The Significance of the Frontier in American History," in *The Frontier in American History* (New York, 1920)

[13] A. M Schlesinger, *New Viewpoints in American History* (New York, 1922), chap. 2; Fulmer Mood, "Turner's Formative Period," in *The Early Writings of Frederick Jackson Turner* (Madison, 1938): 3 ff

[14] R. H. Shryock, "Cultural Factors in the History of the South," *Jour Southern Hist* 5· 333 ff , 1939.

[15] Note especially Ramsay, *A Review of the Improvements, Progress and State of Medicine in the XVIII Century* (Charleston, 1801)

[16] Eric Goldman, "Middle States Regionalism and American Historiography," in *Historiography and Urbanization* (edited by same author) (Baltimore, 1941): 211 ff. See also his biography of McMaster, about to be published by the University of Pennsylvania Press.

expected in a more sophisticated age. Of late, it has been suggested that historians should frankly state their presuppositions, as a caution both to themselves and to their readers. But here, again, is a return to the position taken *long before* by Prince

So much for motivation in the ordinary sense In proceeding to the consideration of historical methods, one may first comment on the forms of expression which have been employed in order to realize given objectives. Colonial historians were not particularly successful in developing the literary phase of their procedure Few of them seem readable today. Lest this be ascribed entirely to the literary level of that period, note that they were condemned by eighteenth-century critics as well. Jefferson said of Stith's history of Virginia, "He was very exact but of no taste in style He is inelegant, therefore, and his details are often too minute to be tolerable." [17] The implication was that Stith's desire to be accurate and comprehensive had inhibited the use of any adequate means of presentation The historians themselves were sometimes aware of this subtle relationship between objectives and form Prince, for example, was so anxious to be reliable that he deliberately adopted an annalistic procedure lest he be tempted into stylistic embellishments that would warp his narrative.

This situation reversed itself with writers of the Middle Period, and particularly with those who associated themselves consciously with a literary tradition Writing in a romantic era and with dramatic effect, their works acquired a wide popular appeal. Parkman, Prescott, and Motley afford perhaps the best illustration here, but to a lesser degree the same could be said of Bancroft. All of these leaders were associated with "the Flowering of New England" which, in so far as it differed from cultural vegetation in other parts of the country, was primarily a literary phenomenon [18] Colonials would have distrusted them for the same reason that modern historians are inclined to be critical, that is, for fear that a love of effect was likely to involve dramatic distortions.

The modern, scientific writers reverted after 1880—perhaps unknowingly—to the general attitude of the Colonials. Style was incidental to objectivity In due time, they were then subjected to the same criticism—and for the same reasons—that Jefferson had directed towards Stith Remarks were made about the "Ph. D professors" and their "dry-as-dust" publications. Especially unfortunate, it was held, was the loss of literary appeal and consequently of the public.[19] Academic historians were read only by their colleagues, and the profession advanced by virtue of a sort of auto-intoxication

When it was replied that scientific objectives necessarily inhibited literary effects, certain critics denied this outright It was stressed that a man could be as accurate as he pleased, and still play the artist in composing his narrative There would seem to be some truth in both views, but ultimately the distinction between a scientific and a literary goal is likely to involve a difference in mode of expression. A literary man necessarily emphasizes style as such; for the scientific historian style may be important but is still incidental to other considerations.

The difference comes out nicely in the selection of content The whole question of subject matter will be considered below, but its relation to literary form is so intimate as to justify a momentary digression here A scholar who is anxious to reach the public must select topics which lend themselves to popular appeal. He usually selects the biography of well-known public figures, or dramatic themes like political intrigues, scandals, wars, and the like This is desirable enough in itself Indeed a strong case can be made for greater attention to military history than professional scholars have accorded it, though it hardly follows—as some military men imply—that because of this neglect all the blame for Pearl Harbor can now be passed on to the innocent academics.[20]

But no matter how important dramatic themes may be in themselves, their emphasis involves a danger of neglecting other subjects which possess scientific significance but are of little human interest. The biographies of third-raters, or such themes as land laws or labor legislation, are apt to be overlooked. Or, when considered, these may be distorted—consciously or unconsciously—for dramatic effect If the development of disease is treated, for example, it will be in terms of great epidemics and of great discoveries. Yet the prosaic story of endemic diseases is actually of more significance in the history of mankind[21] But who could compose a literary masterpiece, let us say, on the epic grandeur of gastro-enteritis?

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[17] *Notes on the State of Virginia* (Trenton, 1803) 239

[18] Van Wyck Brooks, *Flowering of New England* (New York, 1936); 323 ff., Richard H. Shryock, "Philadelphia and the Flowering of New England," *Pennsylvania Mag Hist. and Biog.* 64: 305 ff, 1940

[19] See Allan Nevins, *Gateway to History* (New York, 1939). 12 ff, and the same author's article in the *Saturday Review of Literature* 19 (New York, Feb. 4, 1939): 16.

[20] See the Foreword by Col. William A. Ganoe in "Lexington to Fallen Timbers, 1775-1794," *William L. Clements Library Bull.* 37, 1942.

There may be an occasional genius who can be completely scientific and at the same time a great artist in historical writing, but this type is so rare that one can almost leave it out of his calculations For the most part, the two functions had best be distinguished in terms of scientific work on the one hand, and of the difficult and desirable art of popularization on the other

This is not to say that academics need lose all the values inherent in the literary tradition Some, it must be admitted, were unnecessarily dull, but others, like McMaster, Dodd, and Ulrich Phillips, were distinctly readable And even those who were "dry as dust" at least retained a quasi-literary feeling for continuity and sequence—just the qualities which are often lacking in amateurs Whatever the shortcomings of his style, the professional at least constructed a narrative.

To sum up at this point, one may claim much for the academic historians In the collection of sources and in the critical use thereof, they certainly surpassed both the Colonials and the Victorians. One need only compare a major recent work like that of Charles M Andrews with earlier accounts of the Colonial period, in order to see what marked technical progress has been achieved And in methods of presentation, the scientific writers have been as effective as most of the eighteenth-century scholars, and more successful than many later amateurs In a sense, they retained the best in the Colonial tradition of accuracy, advanced this further, and then merged it with the Victorian feeling for literary form as far as this was consistent with their larger objective In comparison with earlier schools, therefore, they may be credited with introducing what amounted, in toto, to a new methodology

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There is, however, another perspective from which one may view the recent historiography. This is the viewpoint of the natural sciences From that angle, scientific historians have rarely introduced new methods but have rather improved upon the old They still employ the one basic procedure which in natural science would be called that of simple observation They collect and interpret historical data just as these are found, and have rarely elaborated devices for artificially extending their range of observation

It was on this same methodological level that certain natural sciences usually moved prior to the seventeenth or eighteenth centuries Thereafter, in the latter fields, three relatively new methods vastly extended the range of observation, namely, the use of instruments, of experimentation, and of quantitative procedures[22] Astronomy, physics, and somewhat later chemistry, found it relatively easy to exploit these methods and as a result experienced amazing development The biological and medical sciences made use of the new methods, but found them less easily adapted to their fields, and so to some degree relapsed into simple observation again during the eighteenth century. After about 1830, however, biology and medicine were able to increasingly exploit each new method, and experienced an advance comparable to that of the physical sciences in the preceding centuries

From these successes stemmed the idea that social science might also be established, and that quantitative procedures—if not instruments or experiments—could be employed therein Quetelet, among others, made the attempt in the 1840's, but thereafter sociology under the influence of Spencer and others abandoned this level and relapsed back into simple observation and theoretical systematization—just as medicine had done a century before Sociology finally returned to quantitative procedures, as in the work of Mayo-Smith and of Giddings after 1900,[23] again repeating the experience of medicine in an earlier period Note that these changes in method, unlike shifts in motivation, were largely independent of the prevailing intellectual climate—since one science exhibited one type of procedure, and a second another type within the same era. The attempt to trace the history of any given science simply in terms of prevailing intellectual climates, therefore, misses this significant, methodological aspect of its development[24]

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[21] M P Ravenel, "Endemic Diseases versus Acute Epidemics," *Am Jour. Public Health* 10 761 ff, 1920.

[22] John F Fulton, "The Rise of the Experimental Method," *Yale Jour Biol. and Medicine* 3, 300 ff, 1931

[23] Franklin H Giddings, *Studies in the Theory of Human Society* (New York, 1922) 107 ff

The application of these generalizations here is that scientific historians were working, after 1880, in a period when social scientists still gave little heed to modern scientific methods The historians derived their immediate enthusiasm for critical observation, to be sure, from prevailing scientific attitudes, but their conclusions usually lacked experimental or quantitative verification—just as had biology in Aristotle's day or medicine at the time of Vesalius

Gradually, about the time that Giddings and others revived the use of statistics in sociology, American historians began to use statistics, maps, and graphs more than had hitherto been the case Orin G Libby's work concerning the votes in the adoption of the Federal Constitution,[25] or Arthur C Cole's *Whig Party in the South*,[26] could be cited as cases in point But it can hardly be said that most American historians became quantitatively-minded This was partly because history, dealing often with remote periods, found it more difficult to use quantitative methods than did social sciences working on recent events. Economics, and later sociology and political science, made more progress in this direction, and recently have even followed the physical sciences in embarking upon prediction—with some approximate success[27]

The historians may also have been handicapped in this respect by their literary tradition This remained strong, even among those whose claim to literary qualities was ridiculed by the critics. The methodological transition from belles-lettres to science has been difficult, even for those who view themselves as scientific historians

It may be replied that history and other social disciplines cannot, *in the nature of the case*, employ experiments, instruments of observation, or even measurements. It is said that these methods cannot be used in the social fields, since one deals therein with individuals who exercise choice and whose actions are unique and unpredictable One therefore can describe or analyze human behavior only through the "comprehension of the meaning of human experience"[28] Whether such "comprehension" partakes of the nature of common sense, or of some other process not easy to state in psychological terms, is not always clear The idea might easily descend to mere mysticism. Those who take this extreme view seem to overlook its history It is forgotten that medical scientists also once argued that quantitative methods could never be employed in *their* field, because—unlike the physical sciences—it dealt with individuals who were unique and unpredictable This was just the view now held by some concerning social data[29] Yet in medicine it was confounded, within half a century, by a most successful use of clinical statistics and other quantitative procedures This one instance does not prove anything, but at least suggests the possibility that the social sciences may eventually experience a similar development

Many who deny that social disciplines can employ instruments or experiments, admit that measurements can indeed be used, but still feel that large social areas will always remain inaccessible to even this procedure[30] There may be much truth in this. But it is unnecessary to enter here into the problem of the ultimate limits of quantitative procedures in dealing with social phenomena Nor should the probable existence of such limits discourage attempts to push out to them as rapidly as is feasible

The practical point is that methods approaching these procedures can be employed to a greater degree in historical work than they usually have been Statistical analyses may be used *as if* they were instruments of observation, in relation to past as well as to present situations.

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[24] Such attempts have been common in generalization about the history of the social sciences See, e g, Robert MacIver, "Sociology," *Encyclopedia Social Sciences* 7 (New York, 1934) 232 ff,—one of the best historical essays on the subject, yet one that largely omits the development of method Perhaps this explains his apparent doubts (in *Social Causation*, New York, 1942) as to whether one can expect an increasing use of quantitative procedures in the social sciences and history in the future

[25] Madison, 1894

[26] Washington, 1913

[27] See, e g., Stuart A Rice, *Quantitative Methods in Politics* (New York, 1928), Ernest W Burgess and L. S. Cottrell, *Predicting Success or Failure in Marriage* (New York, 1939), etc.

[28] Ludwig Mises, "Social Science and Natural Science," *Jour Social Philosophy* 7 241 ff, 1942

[29] Cf, e g, the view of Mises cited above, concerning social science, and the similar view in medicine as expressed about 1800 in Cabanis, *Du degré de certitude de la médecine* (Paris, 1798) 23, 117

[30] See Charles L. Ellwood (and H E Jensen), *Method in Sociology* (Durham, N C., 1923) Cf, for the philosophical aspects of the problem, Edgar A. Singer, *Mind as Behavior* (Columbus, Ohio, 1924)

And I am inclined to think that in a more regular use of the comparative method, we have a device analogous to that of experimentation. I do not mean here those large-scale comparisons, as between ancient and modern empires, where one deals with analogies rather than exact contrasts. Analogies, though suggestive, are notoriously unreliable[21] But fairly exact comparisons are sometimes available in history and should be exploited wherever possible. If two different cultural groups, for example, farm the same soils in about the same period, with quite different results, one has a situation very similar to that obtained in a laboratory experiment The outcome in this case is probably due to a cultural rather than to a geographical variable.[22]

To put it another way, Clio has sometimes carried out experiments for us, but historians frequently ignore them. Thus western historians ascribed much in American life to the frontier, without first looking across the border to see whether in Canada the constant factor "frontier" produced the same effects in the presence of certain differentials Some Canadian writers have held that it did so only to a partial degree, and so they raise the question whether cultural variables were not sometimes responsible—rather than the frontier—for the outcomes. Southern historians, again, have written much of American slavery without comparing it with the same "peculiar institution" in the West Indies or Brazil

If we cannot experiment in history, we may at least observe carefully those approximate experiments which Clio has performed for us It is not necessary to be mathematically accurate in such procedures in order to profit thereby, although statistical checks, when possible, are as desirable in confirming hypotheses in history as in any other field It should be recalled, incidentally, that the methods of the natural sciences themselves are not always so exact and final as some humanists have assumed. The findings of meteorology and of some branches of medicine are only of an approximate nature. And even the exact sciences have their margin of error. Merz, Rice, Brinton, and no doubt others have pointed this out, in order to show that the social sciences need not despair of approaching similar procedures.

The desirability of the use of modern scientific methods in history and social science is demonstrated by the confused results of simple observation in these fields. This was the same confusion which had once obtained in the biological and medical sciences. One conspicuous feature thereof was the formulation of theoretical systems, in the effort to tie together a multiplicity of data by means of a single scheme of interpretation. The difficulty was that scholars working in fields where quantitative or experimental checks were not yet available, did not wish to wait for such methods, and so set up speculative short cuts across fields of yet unrecognized complexity. Since no cold-blooded statistician or experimenter lay in wait for them, they were fancy-free to declare almost any principle that seemed comprehensive and plausible

There had been examples of this sort in biology at about the beginning of the nineteenth century, as in Lamarck's formula, "the inheritance of acquired characteristics," or in the opposing theory of the Anglo-American, William Charles Wells, concerning "the survival of the fittest in the struggle for existence" In the primary medical science of pathology, the same period witnessed the popularity of various monistic systems, each of which ascribed all diseases to some single cause or condition. With Benjamin Rush this was the rather impressive concept of hyper-tension, while with Hahnemann it was just the itch; but the logic was the same in both cases. Incidentally, there was often some friction between system-makers of this sort, since if one was right, the others were all wrong; and there was no way to discuss their differences except by arguments which for the time being could be proved neither one way nor the other.[23]

Observe how these same phenomena appeared in both social science and history after about the middle of the century. Spencer built a sociological system on the monistic principle of evolution from the simple to the complex, which Sumner and Ward then elaborated in America.

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[21] MacIver, *Social Causation* (New York, 1942) 256 ff, is critical of the use of comparisons by historians, e g, of different revolutions. But MacIver uses historical comparisons himself in the work just cited, e. g, p. 385 Cf some of the actual comparative studies which have occasionally been made by historians, for instance, C Crane Brinton, *The Anatomy of Revolution* (New York, 1938), chap 1, or the studies of naval mutinies in the Russian, French, and British navies, by D. Fedotoff White, published in the collection *From the Shores of America* (New York, 1939), and elsewhere.

[22] Richard H Shryock, "British versus German Traditions in Colonial Agriculture," *Mississippi Valley Hist. Rev* 26 39 ff, 1939

[23] Shryock, *The Development of Modern Medicine* (Philadelphia, 1936): 24 ff.; 139 ff

Bentham had already systematized ethics in terms of a single, all-inclusive motivation politely termed egoistic hedonism. The so-called Marxians found that providential determinism was unsatisfactory as the final force in history, and substituted in its place economic determinism. Carlyle preferred "heroes and hero worship" Other historians, as already suggested, found the outstanding influence a racial or an environmental one; though the latter group varied from a Turner who stressed frontiers, to a Huntington who emphasized climates

Each in his way—Rush, Spencer, Carlyle, Marx, and Turner—was a system-maker Each acquired followers and, no doubt unintentionally, precipitated controversies A few good experiments, a number of measurements, would probably have either confirmed or refuted their theoretical structures, but these procedures were not to be had at once in biology or medicine, and are usually not yet available in social disciplines

It may be held, of course, that monistic theories in any field have been stimulating, even when they could not be subjected to verification And it may be held that, in these cases, the only way to advance is to balance one such formula against another. Thus it can be said that Marx's theory, or Carlyle's theory, has been stimulating even if it must later be modified or abandoned No doubt there is much truth in this. The authors of systematic interpretations have often been brilliant and original, as well as of commanding personality, and they have sometimes advanced their respective fields in a striking fashion. Turner is a case in point On the other hand, there is considerable lost motion—and not infrequently a loss of tempers—in such zig-zag progress from one very positive thesis to another It would seem preferable to proceed more cautiously, even though one loses the assurance of sudden insights and final solutions. Confusing though it be, it were probably best in American history to continuously balance the causative role of all possible major influences of a cultural, a biological, or an environmental character

This will involve continuous attention to the role of major forces, continuous consideration of the historians' frame of reference Recent American historians have been inclined to be too empirical in this regard—too likely to take their basic assumptions for granted. There have of course been exceptions, as demonstrated in Cheyney's essay on "Law in History,"[illegible] in articles by Beard and by Becker,[illegible] and in Teggart's systematic writings.[illegible] But it is usually a sociologist who elaborates a theory of history, rather than an historian If time permitted, it would be interesting to analyze this contrast

One last aspect of historical writing remains for consideration What of content or subject matter—the nature of the data observed? This may be affected by any given theory of causation, thus a clergyman who believed in providential determinism naturally wrote much on religious history, while Marxians like Simon Patton later accorded major attention to economic developments. Meanwhile, as noted, Carlyle and other literary historians featured the biographies of great individuals.

Yet there remained some leeway in the selection of subjects within any causal framework, and there were also those who rejected any scheme of causation and yet had to select their themes on one basis or another. One of the evils of over-simple formulae was that these drove critics to the other extreme of using no theories whatever—the reaction to pure empiricism, well known in the history of various sciences Some historians displayed such an attitude after 1880, claiming that they had no theories but only wished to "let facts speak for themselves." But there was still the question. "What facts?" Here the empiricist let his answer be dictated by habit, tradition, or merely "a hunch" John Bach McMaster, who apparently had little interest in interpretations, once told me that he put in his history whatever facts happened to appear in the public press. He may not have done himself full justice in this statement, but it reminds one irresistibly of Will Rogers' remark "All I know is what I see in the papers."

There has been a general impression that Colonial historians wrote only of Church and State, and that those of the Middle Period narrowed the theme down to the State—that is,

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[illegible] Edward P. Cheyney, in *Law in History and Other Essays* (New York, 1927)

[illegible] C A. Beard (with Alfred Vagts), "Currents of Thought in Historiography," *Am. Hist Rev.* 42 463 ff., 1937; Carl Becker, "What is Historiography?", *Am Hist Rev* 44: 20 ff, 1938. Note also works of Nevins cited above.

[illegible] Frederick J. Teggart, *Theory and Processes of History* (Berkeley, Calif, 1941) to political, military, and diplomatic narratives. Then, we are told, McMaster began writing during the 1880's his social history of the American people. About a decade later his colleague, James Harvey Robinson, popularized the idea that this type of narrative represented a "new history," in contrast to the political studies of the preceding generation

There is much truth in these generalizations, so far as the outstanding historians were concerned At this point, however, one must again watch the shifting denotation of the word "historian" Actually, the wider interest in social and cultural history was always maintained throughout the eighteenth and nineteenth centuries It was sometimes subordinated but never disappeared Colonial histories related not only to religion as well as government, but were full of Indian (i e, anthropological) materials, and gave some attention to manners and customs And certain Colonials felt that the latter theme should be given greater emphasis During the nineteenth century the social perspective was maintained by various amateur historians and antiquarians, as well as by the anthropological group already mentioned At about the time that Bancroft was writing at length on political themes, various scholars reviewed social and cultural developments in relatively brief but suggestive studies. An example will be found in Emerson Davis' *The Half Century, or a history of changes that have taken place chiefly in the United States between 1800 and 1850* (Boston, 1851) But Davis and men of similar interests have received little attention from those writing on the history of our historians

One may take, as further examples of their work, a number of publications by Philadelphians issued between 1865 and 1885, when political themes were supposed to be entirely dominant In 1867 Thomas Wescott began publishing his *History of Philadelphia* in a local newspaper We now have in the Historical Society of Pennsylvania a set of this work bound in 32 volumes, illustrated with drawings and contemporary documents. It is a mine of information on the social and cultural history of the city, as well as the political. Carl Bridenbaugh, in a recent study, declares that everyone who has "worked in primary materials must pay tribute to Wescott's thoroughness and accuracy"[37] And this work appeared some twenty years before McMaster's first volume

Again, if we consider only this city, there were the well-known volumes of Henry C Lea—not a professional—which clearly transcended the political sphere While most of his writings related to Europe, some of them also pertained to America Or there was such a work as Oswald Seidenstricker's study of the Ephrata cloisters The last was in German, and this raises the question whether non-English writings have been overlooked because of the language barrier[38]

Perhaps it will be pardoned if a personal note is inserted here When I became interested in social history, it was with something of the feeling that this was a pioneer field It has therefore been disconcerting to discover that my great-grandfather took certain aspects of social history as a matter of course, in writing the story of a Connecticut town about the middle of the nineteenth century[39] It was even more surprising to find that an older member of the family had shared this view at the end of the eighteenth century, and had then argued in favor of the sort of history that was to be called "new" in 1900 Earlier historians, declared Nathaniel Chipman about 1793, have given too much attention to "battles and sieges only, the intrigues of statesmen, and the revolution of empires" What was needed, he felt, was a study of "the history of man in society," and of "the development of the human mind"[40] Evidently this view had a long history in America, as we know it had in Europe, before Robinson repeated it in our own time

The latter, however, was undoubtedly associated with a revived emphasis among professional scholars upon social and cultural history

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[37] *Rebels and Gentlemen* (New York, 1942) 374. Another instance is the preparation of a similarly accurate, social history of Savannah, written during the 1890's by Thomas Gamble, who was recently mayor of that city It was printed in the annual report of the mayor's office for 1901

[38] *Ephrata, eine amerikanische Klostergeschichte* (Cincinnati, 1883) The whole body of German historical literature relating to this country has never received here the critical attention it deserves See Emil Meynen, *Bibliography on German Settlements in Colonial North America* (Leipzig, 1937); the catalogues being prepared by the Carl Schurz Foundation, etc

[39] Richard M Chipman, *History of Harwinton* (Hartford, 1860)

[40] This is cited in Michael Kraus, *A History of American History* (New York, 1937). 109, from A. O Hansen, *Liberalism and American Education in the Eighteenth Century* (New York, 1926) 56, 57. See also Daniel Chipman, *Nathaniel Chipman* (Boston, 1846)

(It was not the first occasion when professionals were brought back to a view which the laity had always taken for granted.) This has been a stimulating and productive influence, and the end is not yet.[41] But the so-called new history has also been a factor in producing an increasingly difficult situation for professional historians.

On the one hand, the spread of professional interests is undoubtedly wider now that it was fifty years ago. No longer can a student be told that the development of music, or law, or medicine is not a part of History with a capital "H." Associated with these varied interests are developing disciplines which an historian must master to some degree in order to trace his story, or in order to form his general theories of interpretation. Thus if one wishes to treat the history of law, he must be something of a lawyer, and at the same time he is told that he cannot comprehend historical processes in general unless he knows more of anthropology, sociology, economics, psychology, and a little philosophy for good measure. In addition to all this, the rapid accumulation of records makes the task of examining them an almost impossible one for the individual scholar. Increasing complexity of subject matter on the one hand, and mounting bulk on the other, seem to threaten the whole future of historiography.[42]

There seem to be only three possible ways of avoiding this impasse. One is to return to the literary canons of the Victorian era. In extreme form, this amounts to saying "Be as accurate as you can, but first and foremost tell a good story that the public can appreciate. Then you need not worry as to whether all the sources have been employed or all the themes covered."

Many professional historians, however, reject public appreciation as a basic criterion, and feel that this is as incidental to their interests as it is to those of a chemist or a biologist. They would say, "Be as interesting as you can, but first and foremost do a scientific job." This means that all important themes should be covered—no matter how slight their popular appeal—and all significant sources should be exploited. This being the case, there are two possible ways of approaching so difficult a task. One is to provide the historian with a far wider technical training than he now receives. This will call for great versatility, even if it is assumed that he is to work in co-operation with other individuals of like capacity.

The other solution would be to frankly abandon the view that general historians are concerned with research in all aspects of the past. Assume, instead, that the tracing of any particular phase of history is to be the concern of specialists in the related field, for instance, that economists will prepare the economic histories, musicians the musical, and so on. After all, if it takes a dozen or more professions to deal with current developments in their respective fields, it seems illogical to expect one group of general historians to handle the cumulative story of all these fields throughout the entire past. Geographers, who theoretically deal with all subjects in their space relationships—somewhat as historians do in the temporal dimension—face an analogous difficulty.[43]

As a matter of fact, the specialists are already writing much of the history of their own subjects, and in certain fields have always done so. Although some historians may indict this as poaching on their preserves, it would seem wiser to view it as the normal procedure. It should be stressed, however, that such a program calls for the training of these specialists by general historians in both the content and the method of historical work—a training which the specialists often lack at present.

The function of the general historians would then become three-fold, (1) to provide such training for the specialists, (2) to develop their own individual specialties, and (3) to prepare the syntheses of history which they are probably the best qualified to undertake. In other words, the term "history" would relate to the temporal approach to any given subject, and would also be employed in the further sense of a synthesis of all fields in the time perspective. But it would no longer be used to indicate a specific field in the sense that "economics" or "music" denotes a field. Once this usage were followed, such perplexing topics as "the border areas between history and economics"—which phrasing assumes that two co-equal subjects are here involved—would be automatically eliminated.

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[41] The major result, in addition to valuable individual studies like that of Bridenbaugh cited above, has been the "History of American Life" series edited by D. R. Fox and A. M. Schlesinger.

[42] Roy F. Nichols, "Confusions in Historical Thinking," *Jour. Social Philosophy* 7: 334 ff., 1942. The complexity of present historical approaches is indicated in such a work as Caroline F. Ware (ed.), *The Cultural Approach to History* (New York, 1940).

[43] See Ernest F. Griffith, "Classification of Social Science Phenomena," *Jour. Social Philosophy* 6: 232 ff., 1941.

One cannot refer to border areas between a method or an "approach," on the one hand, and a discipline on the other. Nor can one discuss the border areas between a synthesis on the one hand, and a discipline on the other.

This does not mean that general historians should not cultivate an historical approach to a specific subject. Most of them will naturally do their own research in particular areas like economic or political history, and will share these specialties with men in the economics or political science departments who are historically-minded Many general historians have already found such an association with kindred scholars quite stimulating, and it is to be hoped that the latter share this feeling.

Nor need the necessity for specialization blind us to the importance of pulling all the threads together in some final narrative We shall presumably always want histories of the United States, or of Illinois, or of Chicago, as well as studies of particular phases of their respective developments And by the same token, we shall always want general historians and perhaps even "history departments," though this has been denied by proponents of certain types of specialization.[44] We shall want them for the same reason that we shall always need geographers; that is, because both the space perspective and the time perspective require over-all consideration. That the grand synthesis has become more difficult than it was in the days of Bancroft or of McMaster is beyond question. All the more credit is therefore due to those who have provided such able treatments of general American history as are now available in the better college texts[45]; and to the work of so outstanding a contemporary historian as Charles A. Beard. In such scholars American historiography, like other American arts and sciences, has come of age in the sense that it compares favorably with historical writings overseas

[44] See Robert S. Lynd, *Knowledge for What?* New York, 1939, *passim*

[45] E g, those by Carman, Hockett and Schlesinger, Harlow, Hicks, Morison and Commager, Nichols and Nichols, Wertenbaker. There are, in addition, excellent texts covering particular periods (e g, those of Nettels on the Colonial, and of Hacker and Kendrick on the recent era), and certain ones relating to special phases of national development (e. g, the economic histories by Kirkland, and by Cochran and Miller)

HORATIO GATES SPAFFORD, PRECURSOR OF BESSEMER

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(Read November 20, 1942)

WHEN Henry Bessemer turned a blast of oxygen into the molten iron in his first converter, the resultant fury of sparks and flame ushered in the Age of Steel. Within his own lifetime the discovery took rank with the great events in science which have altered the face of society since the Middle Ages. The spawn of his primitive converter now encumber the earth in the form of guns, tanks, bombers, and ships, each belching flame in the manner of its legitimate ancestor. But the converter poured benefits as well upon the ready world, and if these have been outnumbered or drowned in the noise of their less respectable kindred, the result is further evidence that it is easier for the scientist to provide armament for ancient passions than to fortify newly-won gains of the mind. The same dubious potentialities may also be found in the epoch-making discoveries ascribed to Johannes Gutenberg and to James Watt. Yet in 1856 there were candidates anxious to dispossess Bessemer of his place of honor beside the putative fathers of the printing press and the steam engine.

The cautious historian becomes extremely discreet when faced with the necessity of establishing the exact time and place of birth of an idea or an invention. In the history of science, nothing is more certain than the uncertainty of priority. A cursory examination of the score or so of scientific periodicals published in the United States in the first quarter of the nineteenth century discloses some authentic, if rudimentary, branches on the ancestral tree of American science—the steam turbine, the airplane, even the internal combustion engine. The invention of the principle of interchangeable parts is claimed by New England, but Thomas Jefferson witnessed an earlier example of its use in Paris. The exact genealogy of the steamboat, the ironclad, and the submarine are still matters of controversy. Sir Henry Bessemer's invention did not escape the usual challenge. William Kelly, an ironmaster of Kentucky, not only claimed but proved to the satisfaction of the United States Commissioner of Patents that he had begun as early as 1847 to decarburize and desiliconize melted cast iron by injecting cold streams of air into it. Indeed, some of Kelly's protagonists, more loyal than critical in advancing the claims of the American ironmaster, have hinted darkly that Bessemer, disguised as a workman, committed piracy on what was described as "Kelly's air-boiling process." But Bessemer's rank as an inventor of the first importance and Kelly's reputation as an original and competent ironmaster may remain unchallenged. Their stature need not be diminished by a proper recognition of an American pioneer who experimented in the manufacture of iron before either was born.

It was precisely forty years before Bessemer read his famous paper to the members of the British Association for the Advancement of Science that Horatio Gates Spafford, in 1816, submitted to the American Philosophical Society the manuscript of an essay entitled "Cursory Observations on the Art of Making Iron and Steel, from Native Ores of the United States." Unhappily this manuscript no longer appears to be extant, and while we know less about its contents than the members of the committee who considered it, we know more than they did about its author.[1] He was born in Vermont in 1778 of a well-known New England family and was intended for the military profession, but both his profound interest in science and literature and his adoption of the views of the Quakers interfered with this plan. His formal schooling was meager but was supplemented by a wide variety of self-acquired, though undisciplined knowledge. He taught school for a while and about 1800 began experiments in heat and light. His first patent was granted in 1805 for an improved fireplace. His interest in the chemical properties of iron, as he explained to Thomas Jefferson, began about 1800. In 1814 he patented certain so-called improvements in the wheel carriage, the distinguishing features of which were an eccentric, U-shaped axle, fitted to wheels seven feet in diameter, and an air cushion substituted for springs For the latter, he suggested that "a bladder, nearly filled with air, and enclosed in a strong case of leather, presents an action of elasticity, acting precisely on those principles which are best calculated to meet alike the wishes and wants of the philosopher, and the mere economist "[2] Though some of his naive excursions seem to indicate that Spafford was an eccentric dabbler, we have the testimony of General Stephen Van Rensselaer, in a letter to John Kent Kane of Philadelphia, that "If you converse with Spafford for half an hour you will perceive that his mind is stored with a great deal of knowledge original & acquired & there is no possible pretence for supposing that he is deranged " He was the author of a *General Geography, and Rudiments of Useful Knowledge*, published in 1809, but his most important publication, still useful to historians, was his *Gazetteer of the State of New-York*, issued in 1813 and completely revised in 1824 He was the publisher and editor of an interesting miscellany called the *American Magazine*, published in Albany in 1815 and 1816 To these useful publications he added, in 1817, a pseudonymous novel called *The Memoirs of Madam de Morville*, supposedly written by one Maria-Ann Burlingham He was a friend or correspondent of almost all of the scientific leaders in America during his lifetime, and of many public men, including Thomas Jefferson, James Madison, and John Adams

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[1] For a more extended account of Spafford's career, see Julian P Boyd, "Horatio Gates Spafford: inventor, author, promoter of democracy." *Proc Am. Antiquarian Soc.* 51: 279–350, 1942.

The manuscript of Spafford's "Cursory Observations on the Art of Making Iron and Steel" was read before the meetings of this Society held in April and May, 1816, and was referred to a committee composed of Thomas Cooper, Joseph Cloud, and William Hembel, Jr[3] The committee reported that the theory advanced by Spafford required repeated experiment and that the processes which he used in the manufacture of iron and steel were not described in sufficient detail. "The paper in its present state," the members of the committee reported, "is not such as they can recommend for publication, but it is capable of being made so by adding to the facts, and abridging the length of the Dissertation." The consideration of the paper by the Society and by the committee covered a space of four months, and Spafford, congenitally impatient and perhaps actuated by a habitual suspicion that his discoveries would be appropriated by others, requested on July 11 that Peter S Du Ponceau return the manuscript This was done by the distinguished scholar in a characteristically generous letter

> The Philosophical Society heard [your paper] read with much interest, but had not yet come to a decision as to what should be done with it I cannot tell you what their opinion is, because, as a body, they have expressed none, but the enclosed by one of the members will give you an idea of what is generally thought of it All the lawyers are of opinion that it is not a Subject for a patent All, you will get by it is fame, to which I think your discovery is well entitled[4]

The anonymous opinion that Du Ponceau sent to Spafford contains all that we know at present about his process of manufacturing iron and steel "Mr Spafford's paper," wrote this unknown member of the Society, "contains one idea, which, I think is both new & important, viz, That during the Roasting of iron ores, first for the purpose of desulphuration, the next purpose should be not to take away but to add oxygen to the maximum, by exposing the heated ore to the action of the atmosphere. In this state, it is more fusible, requires less charcoal, and can be sooner & more perfectly freed from impurities, especially by long continued fusion All this is as I think new, and just, and well worth experiment both in the large and the small way " The commentator thought, nevertheless, that Spafford's manuscript was too diluted with words, that the process was not described with exactitude, that there was an evident desire to "throw an air of concealment" over the specifications, and that the author's ideas on the origin of iron were not "calculated to do him credit " The comment closed with the remark that "The Paper is so well worth attention, that it is a pity any objection lie against it, especially as the defects can be so easily remedied by the author " Unfortunately, so far as we know, Spafford did not act upon this sage advice.

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[2] Horatio Gates Spafford, *Some Cursory Observations on the Ordinary Construction of Wheel Carriages* (Albany, 1815): 9.

[3] Minutes of the American Philosophical Society, April 19, May 3 and 17, and July 19, 1816 The report of the committee is in the handwriting of Thomas Cooper

[4] Du Ponceau to Spafford, August 2, 1816. This letter, with its enclosure of the anonymous commentary, is in a volume of ms. letters addressed to Spafford and is in the possession of Mr Lloyd W. Smith, of Morristown, N J

But six years later he proved that the high authority of Philadelphia lawyers could be overruled when he secured two letters patent covering his process of making iron and steel[5] A few days later he wrote to Thomas Jefferson and James Madison, obviously with an eye both on patent rights and on immortal fame The letters were almost identical and illustrate Spafford's desire to throw "an air of concealment" even over the records of the Patent Office He wrote to Madison:

> I have now fully realized the truth of a theory of great importance in the arts & to the country, long since conceived, & what has so very long been theory, struggling in the birth, is now mere mechanical demonstration, & may be taught by practise in a few minutes! How, now, shall I avail myself of the benefit of this discovery? I ask thy advice The theory was that all Iron, perfectly pure, is uniformly good, that pure Iron, duly & equally carbonized, makes good Steel & it embraces modes of operation conformable to this theory, designed to make perfectly pure Iron, & Cast Steel, a pure carbonate of Iron The system is all new, & perfectly succeeds, equal to the high expectations I had formed of it. The Steel is of the quality called Cast Steel, has been thoroughly & severely tried, by the best artists & mechanics, & is pronounced decidedly superior to any ever imported I make it from the ores of Iron, Pigs, Bar Iron, &c &c with such facility that it affords profit enough for a good business. A company is formed for manufacturing Steel, men of business, with a half million of dollars capital, bound to make so much as to supply the demand in the United States, giving to me one third of the clear profits Such is the confidence of capitalists that were it possible to carry on the manufacture & keep the process a secret, I could sell the Invention for almost any sum that could be named I can make the very best of Cast-Steel, from our native ores, at about the expense of making refined Bar Iron, by the old process, & can make pure Bar Iron, Castings, &c. for half what they are made, in any country, by the old method In a few weeks I will send thee, should I have opportunity, some cast-steel plough-shares for trial, cast, as the cast-iron ones are. Bar Iron is now worth, per cargo, 80 dolls. a ton, Cast Steel, 500 The Contractors on three half-miles of the Erie Canal, have used three tons of cast-steel this year, at 28 cents a pound. The best English Cast-Steel is a carburet, not perfectly pure, mine is all of one quality, a pure carbonate of Iron—Iron saturated with carbon[6]

Spafford also told Madison that it was his intention to apply to Congress for a special law authorizing him to deposit with the Secretary of State, under seal, the specifications of his iron and steel patents If this were done, he said, he would desire only an annuity of $5,000 per year for the term during which the patents ran, after which the discovery could be made a public benefit. His only further stipulation was that all iron and steel made in accordance with his principle should be stamped with the words "Spafford Iron" and "Spafford Cast Steel." He concluded the letter with characteristic patriotism and belief in himself

> As a discovery, none of modern times exceeds it in importance, and it is all American, all new, no patch-work system, nothing borrowed from the old the work of 20 centuries If the government would act wisely, we could soon stop the importation of Iron & Steel, save our millions of dollars at home, & tell Europe, as Europe tells us, we consider self-preservation the first law of nature We are as independent as you are

Madison, cautiously framing the rough draft of his reply, was interested, but non-committal He doubted whether Congress, under its enumerated powers, could grant the special protection of secrecy desired by Spafford[7] Jefferson, though he was much interested in Spafford's writings and investigations in mechanics, apparently did not reply But the cloak of secrecy that Madison thought could not be guaranteed by Congress was provided by a fire in the Patent Office. Thus was destroyed what is presumably the only evidence, aside from the original letters patent, exactly describing the discovery But the original letters patent may yet be extant, and, until they are discovered, we shall not know the precise degree of kinship that exists between the methods used by Spafford and those evolved by Bessemer That there was a basic similarity is made plain by Spafford's discovery that the purification of melted cast iron could be facilitated by adding "oxygen to the maximum." The simple foundation of Bessemer's great innovation was the oxidization of the impurities in the melted iron by means of air, a process which decarburized and desiliconized the iron within a few minutes On the basis of the evidence now available it seems clear that Spafford had grasped and perhaps had perfected the essence of the principle utilized in 1847 by a Kentucky ironmaster and today associated with the name of Sir Henry Bessemer.

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[5] The two patents covering the manufacture of steel and iron were granted on October 30, 1822 I am informed by the Chief Clerk of the United States Patent Office, in a letter dated July 3, 1942, that "the above patents are out of print and there is nothing available in this office from which reprints may be made Some of the early patents were destroyed by fire and never restored"

[6] Spafford to Madison, November 25, 1822, Madison Papers, Library of Congress Spafford to Jefferson, November 25, 1822; Jefferson Papers, Library of Congress.

[7] Madison to Spafford (rough draft), December 5 1822, Madison Papers, Library of Congress

Ten years after he wrote to Madison, Spafford proved that a strict-construction democrat could be in error about the enumerated powers of Congress when, under a special act of July 3, 1832, he was granted the first secret patent rights ever issued in this country [8] This act was designed to cover machinery and principles involving "new powers . in mechanical philosophy" Two weeks after this act was passed, and just before his death, Spafford added a codicil to his will naming Canvass White, a well-known engineer in hydraulics, as his executor and directing that "all my papers, the Big Book, and everything in relation to my business" be put into White's care [9] Unhappily, White survived Spafford less than two years and the present location of his papers, which presumably contained the specifications of Spafford's iron and steel discoveries, is unknown Spafford's genius for secrecy was powerful in his own day and it has survived in potency more than a century after his death But, though powerful, it was an erratic secretiveness. What Spafford denied to the American Philosophical Society, to two ex-Presidents of the United States, and to us, he freely gave in 1816 and again in 1820 to the Emperor of Russia [10] Perhaps, after all these years, full and exact knowledge of the most important work of this American pioneer, who believed that scientific academies were more useful than theological seminaries, who fought poverty and ill health all his life to advance learning in the young Republic, who was a passionate admirer of Thomas Jefferson and of democratic government—perhaps the final proof of the manner in which he anticipated Bessemer may yet be found in the shadow of the Kremlin

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[8] Richard Peters (ed), "Act for the Relief of Horatio Gates Spafford," *Statutes at Large* 6 502 Boston, 1856

[9] Spafford's will was recorded Oct 4, 1832, "Surrogate's Records Wills and Proofs," 12 260, Surrogate's Office, Troy, New York The codicil naming Canvass White was dated July 21, 1832, and refers to the Special Act of Congress of July 3, 1832 "Canvass White," Spafford remarked in the codicil, "understands the principle of my discovery and will in the event of my death be able to act usefully for my heirs and Estate He is a good man, honest, sincere—a long known and tried friend, worthy of perfect confidence, and a skilful and experienced engineer" This discovery, of course, was not that pertaining to the manufacture of iron and steel but that covered by the special act of Congress. For a brief biographical account of Canvass White, see *National Cyclopaedia of American Biography* (12 258)

[10] Spafford sent a copy of his essay, dedicated to Emperor Alexander, to A Daschkoff, Russian Minister to the United States, in 1816, Daschkoff assured Spafford that "the secrecy of your invention will be strictly preserved" Daschkoff to Spafford, March 10, August 30, and November 29, 1816, in the possession of Lloyd W. Smith, Morristown, New Jersey Peter Paletica, who succeeded Daschkoff, wrote Spafford on April 27, 1820, that he was unable to inform him "how far Daschkoff may have succeeded in laying your plan before our government and whether there are any prospects of acceptance" (*ibid*)

THE EARLY HISTORY OF POLITICAL ECONOMY IN THE UNITED STATES*

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(*Read November 20, 1942*)

As ALL roads lead to Rome, so the history of all systematic knowledge in America leads back to Benjamin Franklin. Frequently he has been called the first American economist. It is true that papers on specific economic problems may be found which antedate Franklin's earliest effort One such was a little pamphlet of 20 pages by Francis Rawle, printed at Philadelphia in 1721, which proposed the issue of paper currency "for the restoring of the sound credit of the Province of Pennsylvania" Another pamphlet by the same author, published in 1725, bore the alluring title, *Ways and means for the inhabitants of Delaware to become rich, wherein the several growths and products of these countries are demonstrated to be a sufficient fund for a flourishing trade.*[1]

The 1725 pamphlet by Francis Rawle, as is indicated in its title, sees in agricultural products the potential "fund" from which "the inhabitants of Delaware" may "become rich," that is, if the plan recommended by the author is followed. By "Delaware" the author means not simply the area of the present state of that name, but the entire valley drained by the Delaware River. The main thesis is an agricultural mercantilism of a crude sort, aiming by means of subsidies to agricultural exports to make the value of the exports to *each* country exceed that of the imports from that country, so that the "Ballance in favour" of the Delaware region may be received in "Bullion" The subsidies were to be raised by taxes on land, but this would not be a burden upon landholders because the lands would be increased in value by the increase in the prices of the products caused by the subsidy Thus "the Delaware" could lift itself by its bootstraps

Franklin's earliest effort in the economic field was made years before the speculations and experiments in natural philosophy for which he is best known In 1726, when he was only 20 years old, he was the prime mover in the founding of the discussion club called the Junto, which developed into the American Philosophical Society some 17 years later The live issue of the day was whether the paper currency issued by the Pennsylvania Assembly in 1723, based on land mortgages, should be continued The debates in the Junto had, as Franklin records, possessed him "so fully of the subject" that he was moved to write what he called "a modest enquiry into the nature and necessity of a paper currency" First printed in the *Maryland Gazette*, it was issued in 1729 as a pamphlet and was the most widely read work on paper currency that appeared in Colonial America It exerted great influence toward assuring the continuance of the Pennsylvania issues and doubtless those of other colonies This "modest enquiry" comes near to being a general treatise on political economy in its attempt to relate a variety of economic effects to a plentiful supply of money in a community Highly ingenious and effective as contemporary propaganda, it yet fares badly at the hands of modern critics. The youthful Franklin had hazy ideas regarding the amount of paper currency that can be issued without depreciation. He alternated between a vague recognition of the truth that there is such a limit, and the erroneous notion that "if there may be at some times more than enough, the Overplus will have no effect towards making the currency as a currency of less value than when there was but enough, because such overplus will not be used in trade, but be some other way disposed of "[3]

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* The field of money and banking has been reserved by the Committee for a future paper, and is therefore touched upon here only incidentally

[1] Although the title page declares that it was "printed and sold by S. Keimer, in Philadelphia, MDCCXXV," Franklin said that he had printed it When William Rawle, a great-grandson of the author, was dining with Franklin in Paris, Franklin said to him "When I set up business in Philadelphia, being in debt for my printing materials and wanting employment, the first job I had was a pamphlet written by your grandfather; it gave me encouragement and was the beginning of my success." (Spark's *Life of Franklin:* 242.) This statement was reported in a manuscript entitled, "A Memoir of William Rawle," in which it is said that the book by Francis Rawle, "as far as I know, was the first original treatise on any general subject that appeared in this province." A reply to *Ways and Means*, entitled *A Just Rebuke*, etc., supposed to have been written by the notable James Logan, was published the same year (1725); to this Francis Rawle published a brief reply the next year. Original copies of all three essays are in the library of the Historical Society of Pennsylvania. The first of these was privately reprinted in a limited edition in 1878, from what was then the only copy known to exist

It is true that Pennsylvania more nearly succeeded than did the other colonies in so limiting the issues as to avoid great depreciation, but when Franklin was writing, five years after the first issues, the notes had already depreciated 8 percent as measured in silver, and 13 percent as measured in gold coin[4] After the unhappy experience with the Continental notes during the Revolution, Franklin is believed to have revised or qualified his earlier belief in the virtues of paper money, but even after his death his authority was invoked in favor of the disastrous issue of French assignats However, as he records in his *Autobiography*, his early service to the cause of paper currency in Pennsylvania was substantially rewarded by his being employed "in printing the money, a very profitable jobb and a great help to me."

Franklin's reputation as an economic thinker rests more securely on his later works Apart from numerous passages occurring in letters and papers on other subjects, Franklin's economic writings include ten major titles (as listed in the Smyth collection, vol 1, p 136) Of these, three (1729, 1765, and 1781) are on paper money, and the others cover a wide range of contemporary problems population, agriculture, manufacturing, national wealth, wages, commerce, physiocratic doctrine, etc Although they cover a wide scope, they do not constitute a systematic treatment of political economy. Best known to students of economic thought is Franklin's essay on population published in 1751 This undoubtedly influenced the views of Adam Smith, whom Franklin met years later in London, and it both anticipated and surpassed in balanced judgment the views of Malthus, published nearly 50 years later The most influential of all Franklin's economic writings was a little pamphlet called *The Way to Wealth*, which ingeniously combined the sayings of "Poor Richard" into a code of individual industry, frugality, and enterprise, breathing the spirit of the then dominant American philosophy of saving and self-reliance Franklin, thou shouldst be living at this hour! Poor Richard quaintly confessed "I was conscious that not a tenth part of the Wisdom was my own" *The Way to Wealth* is said to have been printed and translated oftener than anything else ever penned by an American It appeared in more than 150 editions and was translated into every European language

Both Franklin and Jefferson, during their missions to France, formed friendships with the leading Physiocrats and became imbued with the physiocratic doctrines Probably on their nomination, several democratic French economists were elected to membership in the American Philosophical Society the Marquis de Condorcet and the Abbé Raynal in 1775, Brissot de Warville in 1789, and Pierre S Dupont de Nemours in 1800, during his brief first stay in America

In our Colonial period nearly all discussion of public questions was concerned primarily with the political relations of the colonies to the mother country, yet the economic aspects were fundamental The economic aim of the colonists was freedom from the control of the English Government, and from the restrictions it imposed upon the commerce and manufactures of the colonies in favor of English merchants and the English treasury

The beginnings of national government under the Constitution in 1789 ushered in a new era of discussion concerned with the economic problems of the young and growing nation. The most important economic paper before 1800 was Alexander Hamilton's famous *Report on Manufactures*, submitted to Congress in December, 1791. The first national tariff act, passed in 1789 ostensibly for revenue purposes, had afforded incidentally and in part intentionally a substantial degree of "protection" to various industries The *Report* was the first systematic plea in America for still higher rates to foster infant industries. It has ever since been the main arsenal of arguments in favor of an intentionally restrictive tariff, as contrasted with a revenue tariff The *Report* evidences much familiarity with economic writings and contemporary economic conditions, and as Hamilton's authorship of the *Report* was long unquestioned, his considerable reputation as an economist has been based almost entirely on this belief. But recently a scholarly librarian had the opportunity to examine the unpublished papers of Mr Tench Coxe, and discovered what appears to be the original draft of the *Report* in Tench Coxe's handwriting, with numerous interlineations, not just a fair copy

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[3] Smyth, *Franklin's Collected Works* 2 150

[4] Derived from figures given by W M Gouge, *A Short History of Paper Money and Banking*, chap 2, 1833 In 1786, when the newly liberated states were rocked by violent discussion of the need for, and the merits of, paper money issues, there was published in Philadelphia a little *Essay on money as a medium of commerce*, which is most remarkable for its grasp of the subject, its moderate tone, its open-minded recognition of both advantages and disadvantages in paper currency issues, and of the exact point at which depreciation of the notes in terms of bullion may be expected to set in It equals if it does not excel in these respects anything on monetary theory before the Ricardian era The author was John Witherspoon, President of the College of New Jersey (now Princeton University), who was a signer of the Declaration of Independence and had been a member of the Philosophical Society since 1769

For years Mr Coxe, a native of Philadelphia, had been foremost in the movement for higher tariffs In 1787, while the Constitutional Convention was in session, he had read a paper at the home of Benjamin Franklin, in which he had presented essentially the doctrines of Hamilton's *Report* on behalf of a "balanced economy", and the same year he helped to organize a "Society for the Encouragement of Manufactures and the Useful Arts" Coxe was a man well versed in contemporary economic writings, and of remarkable ability in the assembling of economic data, and during the year and a half before the presentation of the *Report* to Congress he had been Hamilton's assistant in the Treasury Department, engaged in collecting the interesting factual material which the *Report* contained Hamilton is known to have held personal conferences with Coxe regarding the *Report*, and there can now be little doubt that Coxe was its true author, although Hamilton sponsored it as reflecting his own political wishes, if not his economic beliefs. Coxe therefore was Hamilton's political ghost writer, as Hamilton was Washington's in certain matters They were the pioneers of a great modern army It is of interest that Hamilton was a member of the Philosophical Society when he made his *Report*, and that Tench Coxe was elected to membership five years later

Hamilton's chief interest in this "plea for a balanced economy" was no doubt very different from that of Coxe It was almost wholly in the political rather than the economic bearings To Hamilton, high tariff rates were merely the means to the end of securing the much-needed support of a wealthy conservative class for the feeble young Federal government He succeeded brilliantly in this purpose, but sowed the dragon's teeth of class interests and pressure politics, whose progeny, as organized manufacturers, organized farmers, organized silver miners, and organized labor, threaten today to destroy both free economic and true democratic institutions

In the next quarter-century the most noteworthy economic writers were Tench Coxe and Albert Gallatin The latter, also a member of the Philosophical Society, wrote on national finances and public debt, and although he was a citizen of Pennsylvania, he was a consistent opponent of high tariffs—the ablest northern exponent of that view during the period of threatened Nullification over the tariff issue

In 1818 was published, with a laudatory preface by Thomas Jefferson, an English translation of a theretofore unpublished little treatise on political economy by Destutt de Tracy, who had been a member of the Philosophical Society since 1806 In 1821 appeared an American edition of an English translation of J B Say's lucid treatise on political economy along the lines of Adam Smith, intelligently edited for American readers by a Philadelphia lawyer, Clement C Biddle, who was elected to membership in the Philosophical Society the same year This work in successive editions was, for some years (until Wayland's book, 1837), probably the most widely circulated text on political economy published in America

In 1820 began an era of more extended and systematic treatises on political economy written by Americans In the next half-century 15 authors especially worthy of note published one or more such books (and successive editions), apart from a number of minor writers and pamphleteers These authors fall into two well-marked groups according to their attitude toward the dominant issue of the tariff Nine were in favor of freedom in foreign commerce, and the others (along with numerous disciples) were advocates of its restriction The latter group, whose members assumed and were generally called by the name of nationalist economists, had its beginning and long its chief center in Philadelphia However, a nationalist school developed in large measure independently in New England, in the period of active tariff discussion after 1815 Let us give attention first to the New England writers of the nationalist school, returning later to those of Pennsylvania.

The dominant business interest of New England before 1812 had been commercial, and New England representatives in Congress had opposed the high-tariff movement However, the embargo acts and war blockades between 1808 and 1815, paralyzing commerce and raising the price of manufactured goods, had stimulated a hectic development of manufactures in that region The resumption of imports in 1815, and the post-war depression of domestic manufactures from 1816 to 1820, so changed the dominant self-interest and political opinion of New England that Daniel Webster and other New England representatives in Congress were forced to make a humiliating reversal of policy on the tariff issue. Reflecting this changed sentiment, three New Englanders, all lawyers, published between 1820 and 1828 treatises on political economy whose main purpose was advocacy of higher tariffs.

The earliest and the most noteworthy of the New England nationalist economists was Daniel Raymond, whose book appeared in 1820. When a young man, he had moved to Baltimore to practice law, but, having no clients, wrote a book on political economy for his own amusement and instruction, as he whimsically confesses. His preparation, in addition to legal studies, seems to have consisted of the reading of Hamilton's *Report* and several foreign texts on political economy. He alternates between modest confessions of his incompetency to write on political economy and expressions of contempt for the views of most former writers With some warrant, however, he declares that his book "is a more general treatise than any that has to my knowledge been written in our country." His outstanding contribution to theory was his distinction between national wealth and individual wealth, two things which, he rightly said, are frequently confounded, although they are "distinct and different." In his view, national wealth consists of all useful resources, natural and artificial, whereas individual wealth (better called capital) consists of the capital-value of property rights, which may actually be increased by scarcity. This is a sound and illuminating economic-legal conception, a glimpse of what of late has been called the paradox of value; but unfortunately it was not developed further in America until independently revived much later.

Raymond's second and less valid basic proposition is that "a nation is a unity and possesses all the properties of a unity." This was really Hamilton's doctrine of "a balanced economy" in a new dress With this half-truth Raymond plays fast and loose for hundreds of pages. He urges that because of this "unity" the increase of profits and wages in manufactures by means of high tariffs benefits the nation as a whole even though the rest of the nation has to bear the burden. It is the simple rule of heads we win, tails you lose. It is startling to discover later that Raymond's whole argument is based on the assumption that without a high tariff there must always be great numbers of men out of employment, and that he believes raising the tariff to a prohibitive level is a panacea for the problem of unemployment both in post-war depressions and permanently He ignores the fact that the tariff act of 1816 increased the rates substantially above those of any previous acts. His was the childish faith attributed to one of the sponsors of the ill-starred Hawley-Smoot Act in 1930, who was said to have declared "Within six weeks the depression will be over", and 12 years later it was still not over, when Pearl Harbor brought it for a time to a tragic end. Raymond's ideas on unemployment and its causes were evidently the result of superficial observation of the post-war depression after 1815, whereas the normal condition in America was a shortage of labor relative to the abundance of natural resources.

Mathew Carey (of whom later) was so pleased with Raymond's book that he offered to finance a professorship for him in the University of Maryland, but nothing came of this proposal. However, Raymond came into personal touch with the Pennsylvania nationalist group at this time, and the considerable success of his book, which ran through four editions, was largely due to their favor

The next New England nationalist political economist was Alexander H. Everett, a brother of Edward Everett. Prominent in law and in politics, he published his book on political economy in 1826. The two Everett brothers were elected to membership in the Philosophical Society in 1831 Another lawyer, Willard Phillips, later a judge and then prominent in the insurance business, published a text on political economy in 1828 in which, along with advocacy of high tariffs, he clearly envisaged the modern theory of subjective value In general doctrine his text ranks as the ablest American work on political economy before that of Tucker nine years later.

Mention may be made here, out of the chronological order, of the later New England nationalist economist, Francis Bowen, whose somewhat distinctive and original book, entitled *American Political Economy*, appeared in 1856 Broadly educated in liberal arts, theology, and moral philosophy, Bowen was in turn language teacher, editor for years of the *North American Review*, and for the last half of his life professor of moral philosophy at Harvard, where he also taught political economy until his death in 1890 Both in his general economic doctrine and in his tariff views he was out of accord with his younger contemporaries at Harvard, including Dunbar and Taussig, who adhered closely to the English orthodox theory and were pronounced free-traders, whereas Bowen in both respects was pretty much in agreement with the nationalist school.

If we turn now to the Pennsylvania branch of the school of nationalist economists, it may be said to have been founded by Tench Coxe and Alexander Hamilton, but for more than half a century its outstanding leaders were the two Careys, father and son, both members of this Society The brilliant Irishman, Mathew Carey, because of his anti-British agitation in Ireland when he was a mere lad, had been forced to flee first to France, where he met Benjamin Franklin, and later to the United States, where he arrived in 1784 at the age of twenty-four Like Franklin, he had learned the printer's trade, and the publishing house which he founded in Philadelphia became, and continued for years to be, the greatest in the United States At once after arriving he began to participate in political discussions. He pictured himself as a peacemaker, and one of his favorite titles for polemical tracts was *The Olive Branch*, in which he counseled his opponents to be sweetly reasonable by agreeing with him no matter how much it was against their interests to do so He was a tireless fighter for his convictions and his sympathies. He delighted, so to speak, in hand-to-hand intellectual conflict, and in ridiculing, and often successfully exposing, weaknesses in the arguments of his opponents. The variety and volume of his writings on public questions is astounding Probably the best collection of them is in the library of the Philosophical Society, many of the pamphlets containing presentation inscriptions in the author's own hand

After the close of the Revolutionary War, Pennsylvania was the leader in the movement for state tariffs. The Pennsylvania State law of 1785, levying moderate rates on imports, was the model for the first national tariff act passed in 1789, with protectionist features introduced largely by the efforts of the Pennsylvania delegation in Congress. That state continued strongly to back efforts to increase restrictive tariff rates, which were more than doubled in the next quarter-century When the tariff issue blazed into still greater importance after 1815, Mathew Carey took Hamilton's *Report on Manufactures* as his gospel He claimed Hamilton as his spiritual father and repeatedly wrote under the pen name of Hamilton His greatest activity in tariff propaganda dates from 1819 Whether or not he had been a member of the Society formed by Coxe in 1787, Carey was active in 1819, 1824, and 1827, in organizing several similar societies for the "encouragement" of manufactures by means of tariffs

Critics have frequently declared that Mathew Carey's tariff convictions were merely the rationalization of his political prejudices, that his advocacy of high tariffs sprang from his intense hatred of all things English which he brought with him from Ireland, and that his chief motive was to injure England by stopping imports, which at that time were largely from England. However that may be, Carey appears not to have profited personally by his propaganda, and he was not engaged in manufactures which would benefit by higher rates, although many of his close associates were

When Mathew Carey died at a ripe age, in 1839, his place as leader of the nationalist school was taken by his even more distinguished son, Henry Charles Carey. Henry Carey, born in Philadelphia in 1793, had been drilled from early youth by his father in the Catholic Irishman's hatred at that time of everything English, and with a zeal for high tariffs for America as the means of injuring England However, until he was 42 years of age, he was engaged in the publishing business, and his first book on political economy, an *Essay on the Rate of Wages*, was published in 1835. From that time, as new works from his pen appeared, his European reputation grew until it exceeded that of any other American economist His fame was particularly great in Germany, where his nationalistic views were in full harmony with those being advocated at the same time by Friedrich List. Georg Friedrich List, the founder of the enormously influential German nationalist school of political economy, had, during a seven-year sojourn in Pennsylvania between 1825 and 1832, been in closest personal touch with the whole Philadelphia group most active in tariff propaganda, including Mathew Carey, Charles Jared Ingersoll, and P S. Du Ponceau, all members of the Philosophical Society. Undoubtedly List derived from them in large part, if not wholly, his nationalistic views on the advantages of restrictive tariffs, views which later were adopted and put into practice in Germany by Bismarck

Irrespective of the validity of his beliefs, Henry C Carey was marked for preeminence by the vigor of his literary style, by a certain audacity of thought, by sublime confidence in his own opinions, and by the remarkable volume and variety of his writings on economic subjects Except for his father's biased instruction, he was self-trained through an astonishing range of reading He aspired to attain, and in some measure achieved, a larger social philosophy rather than a mere political economy His writings during the first decade were mainly given to a refutation of the Ricardian rent doctrine and of the Malthusian principle of population, without (it must be said) a full understanding of either Thereafter his dominant interest was more and more the tariff issue The one thing that he saw clearly and truly from the first was that conditions in America did not warrant the pessimistic conclusions of the English school Carey held in much higher regard the views of Adam Smith, which the Ricardians thought they had improved or displaced in essential matters, and many recent students agree with Carey's judgment in this respect Carey was optimistic and dynamic in contrast to the static pessimism of "the dismal science" as developed in England As I have said on another occasion in an international gathering "American economists from the time of Carey have naturally thought of change and progress as normal, and have protested against the assumption of fixity of customs, in social institutions, in the land supply, in the labor force, and in the industrial processes" But while Carey rejected a large part of the so-called orthodox theory, he retained some of its worst features He accepted the fallacious wage fund theory, and developed to further absurdity the labor theory of value by explaining even the value of all land and natural agents as due *solely* to the labor embodied in them

In contrast with what with some warrant he called the "discords" of the English school, Carey proclaimed the "harmony of interests" of all classes of society, a thought expressed also in his *Principle of Association*,[4] which he and his disciples deemed to be the highest achievement of his thought In essence this is much the same as Hamilton and Coxe's balanced economy and Raymond's national unity, and Carey used it in the same way to identify the interests of the whole nation with those who benefited by tariffs, while ignoring the injury to others. If "protected" manufacturers gained by the tariff, everybody gained, but if other classes of the nation lost, nobody lost. It was a lop-sided unity and a discordant harmony

With a wide European reputation, Henry Carey was not without honor in his own country He was reverently called "The Master" by a devoted group of disciples,[5] and was fulsomely praised by the partisan advocates and the beneficiaries of tariffs But, like Henry George, he was embittered in old age because his views (especially those on the tariff) had been so generally rejected by college professors, that blind and wicked generation Only one elementary text on the lines of Carey, that of Robert E Thompson, seems to have had even a limited use in the classroom Only one university professor, the original, eccentric, and lovable Simon N Patten, could be said to have been his disciple in any considerable measure However, other Americans, returning like Patten from studies in Germany imbued with the ideas of the Historical School, were more appreciative of Carey (at least of some of his ideas) than were the stricter followers of the orthodox English economics Distinguished in the last generation among these Americans influenced by their study in Germany were Professors Ely, Hadley, Farnam, James, Jenks, Seligman, J B Clark, Ripley, and Seager, to name only a few. But all traces of a distinctive nationalistic school had been lost by the end of the century, although some grains of gold in its thought have been conserved in the psychological, humane, and welfare economics of the present century.

So much for the nationalist school of political economy Let us now briefly identify the writers favoring free trade, or rather a low-tariff policy, preliminary to the attempt to indicate certain common elements marking the thought of American writers on political economy in contrast with those of contemporary England

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[4] A paper on this subject was presented at a meeting of the Philosophical Society in 1894 by Henry Carey Baird, nephew, namesake, and ardent disciple of Henry Carey It may be found in the *Proceedings* (33 144, 1894) under the title "Association the dominating need of man and the keynote of social science."

[5] Among the minor writers of the nationalist school, the following eight men, nearly all of whom were in personal touch with Carey, are probably the most noteworthy (the dates being those of the publication of the first, or the only, book of each. Nathaniel Ware, 1844, Calvin Colton, 1844, George Opdyke, 1851; E Peshine Smith, 1853, Henry Carey Baird, 1875, William Dexter Wilson, 1875, R E Thompson, 1875, and William Elder, 1882 Ware, Baird, Thompson, and Elder were members of the Philosophical Society

The principal writers of what we have denominated the free-trade school may be noted as follows, with the dates of their first general works on economics John McVickar (1825), theologian, Columbia College, New York, largely educated in England (included here somewhat irregularly, since he wrote no independent text, but merely edited an American edition of McCulloch, the strictest of the English Ricardians), Thomas Cooper (1826), an English natural scientist who lived for some years in Pennsylvania, and then moved to South Carolina, where his free-trade views found a more congenial atmosphere, Jacob Newton Cardoza (1926), also of South Carolina, editor and active in public life, a writer of ability and considerable originality, George Tucker (1837), lawyer, member of Congress for three terms, then long-time professor at the University of Virginia, perhaps the most original and thoughtful of the economists of this period, though not popularly known or widely influential in his day, Francis Wayland (1837), theologian and moral philosopher, long President of Brown University, and author of the text on political economy most widely used in the quarter-century before the Civil War, Henry Vethake (1838), born in British Guiana, mathematician, natural scientist, and moral philosopher, who taught a wide range of subjects at Columbia, Princeton, and Pennsylvania Then three other writers considerably later John Bascom (1859), trained first in law, next in theology, and then successively teacher of English literature, President of the University of Wisconsin, and professor of sociology and political economy at Williams College, Arthur L. Perry (1865), liberally educated and for some years professor of political economy at Williams College, and Amasa Walker (1866), successful business man, long active in politics, including service in Congress, and father of Francis A Walker, still more distinguished in political economy.

In the colonial period the leading public men and writers on public questions without exception favored a policy of free trade *on principle*, although they not infrequently declared that a restrictive tariff might sometimes be justified (as a necessary evil) when used in retaliation against an unfriendly tariff policy of other nations Hamilton was the first American of political prominence to voice the desires and demands of domestic manufacturers that higher customs duties be levied for the express purpose of excluding competing imports and thus raising the prices of their own domestic products

The classification of American writers after the colonial period according to their attitude on the tariff question is obviously not truly "scientific," but rather is an empirical classification according to difference of belief in regard to one practical public policy among many in the choice of which economic theory has some application Yet this provisional classification has been perhaps justified for the present purpose by the fact that in the public mind, during the period from the adoption of the Constitution until after the Civil War, the tariff loomed larger than any other one economic issue in national politics, and was generally assumed to be chief subject-matter and *raison d'être* for political economy Indeed, this conception still persists in some tariff-favored circles

When, however, the attempt is made to classify the American political economists of the period reviewed with respect to their more fundamental economic doctrines (a more "scientific" classification, let us say), a very different grouping results With few exceptions a surprising amount of agreement is found, irrespective of the differing attitudes toward the tariff issue This agreement is such as to constitute, it may fairly be said, a characteristic American political economy in contrast with the contemporary English school However, there is still this noteworthy distinction the nationalist school sincerely believed and argued that disproof and rejection of certain theoretical tenets of the orthodox English school was itself logical and conclusive proof of the fallacy of free trade and of the merits of a restrictive commercial policy; whereas the free-trade writers, most of whom also departed in greater or less degree from the tenets of English orthodoxy, believed that the conclusion in favor of freedom of commerce was a simple deduction from the economic principle that both parties normally gain by freely exchanging

The characteristic and distinctive American views on general political economy may best be indicated by comparing them with those of the contemporary English Mill-Ricardian school of political economy. This was a strictly dated and strictly insular explanation (with some lag) of the pathological economic conditions in the British Isles midway in the Industrial Revolution during and just after the Napoleonic wars, say between 1800 and 1825, continued with slight amendment by J S Mill after 1848. These peculiar conditions were mainly the scarcity of agricultural land in the British Isles to meet the needs of a rapidly increasing population, the record-breaking high price of food (aggravated by war conditions), the great concentration of land ownership and the almost complete separation of investment in land from that in commerce and manufactures, the entail and non-salability of land, and the relative superfluity of labor with consequently depressed wages along with abnormally high profits and high agricultural rents In all these and in other respects the contemporary conditions in the United States between 1790 and 1860 were strikingly different

It is true, as has been shown in repeated studies, that the English writers of the so-called orthodox school not only differed with each other in a good many details, but were frequently either ambiguous and self-contradictory, so that an exhaustive examination of their views would be a task far transcending our present purpose Indeed, it may well be questioned whether the term "orthodox" is not a misnomer when applied to a miscellany of views in which there was so much of heterodoxy Yet, if we pass over many minor and some greater exceptions, there was, among the English economists of the Mill-Ricardian school, a substantial measure of agreement on various fundamental doctrines, just as there was among American economists so considerable a measure of dissent from these doctrines

The following may be taken as the chief criteria of the "orthodox" political economy. (1) the Malthusian population doctrine, (2) the Ricardian rent theory, (3) the conception of capital as consisting of "artificial" physical wealth, (products of labor), excluding from capital all natural agents (land and its value), parallel with this distinction and depending on it, the conception of rent and interest as incomes derived from distinctly different classes of agents (land and artificial agents, respectively), (4) the conception of wealth as limited to commercially scarce goods, those having market valuation, excluding from wealth (and from the scope of political economy) the free gifts of nature, thus linking wealth with scarcity and market price rather than with the abundance of goods

Of the writers we have named (either as nationalists or as free-traders), only three adhered almost completely to the orthodox doctrines. These were McVickar, Cooper, and Vethake, all of whom followed closely McCulloch's text. All the others more or less fully rejected or qualified these doctrines, sometimes radically to the extent of ignoring the elements of truth in them when carefully interpreted, sometimes merely denying that they applied to American conditions, as for example, that there was danger of too rapid increase of population in the United States, or that the historical order of the "progress of rent" had been from the best to the poorer lands, as the Ricardian rent doctrine seemed to them to assume

Not only the nationalists but some others inclined to much the same view held by Raymond and M Carey, that there is no special "law of rent" in the Ricardian sense, that the explanation of rent comes under the general law of supply and demand for scarce desirable things and uses (a view recently more widely accepted).[6] This thought is also rather fully implied in the doctrine (otherwise patently erroneous) taught by Henry C Carey and his disciples that the value even of natural agents is entirely produced by (and attributable to) labor—a view taken also by some free-trade writers, as by Vethake (1838), and notably by Perry (1865) who acknowledged his indebtedness for this idea to the optimistic French writer, Frederick Bastiat (1850).[7]

Most American writers of both tariff groups rejected also the orthodox distinction between (physical) capital and land, and included land (and land values) in the concept of capital (in both the physical and the value sense) Likewise (overlooking some significant legal contractual differences) they rejected the orthodox distinction between rent and interest as incomes from different kinds of physical agents (natural and "artificial" agents, respectively), and accordingly they treated rent and interest as simply two names for essentially the same thing. This was in contrast both with conditions and with business practices in Europe, but was in accord with those in America, where land was as freely salable as were other forms of wealth and was one of the commoner objects of commerce, of investment, and of financial speculation Thus, almost unanimously, American writers on political economy looked upon land as a form of capital considered as physical productive agents, and upon the investment-value of land as a form of capital considered as a value-fund invested in business Therefore, contract rent was viewed by them to be an element of business costs as fully as the monetary cost of machinery, of labor, or of any other use and service of production These significant departures from "orthodox" doctrines characterize the views not only of the nationalist writers, but to some extent even those of such otherwise stanchly "orthodox" free-traders as Cooper and Vethake, and much more those of the more heterodox free-traders such as Cardoza, Amasa Walker, Perry, and Tucker

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[6] For a fuller discussion of the rent issue, see John Roscoe Turner, *The Ricardian Rent Theory in Early American Economics*, 1921 (with an introduction by Frank A. Fetter). The treatment is less limited in scope than the title implies.

[7] Henry C. Carey and his admirers accused Bastiat of plagiarizing this idea and the conception of the economic harmonies. For a brief impartial discussion of this charge, see L. H. Haney, *History of Economic Thought*, rev. ed., 304–305, 1920 It may be remarked that whereas Carey used these ideas to support his extreme protectionist conclusions, Bastiat, Perry, and others were equally convinced that they were consistent with a policy of free trade.

A comparison of American and English writers with respect to some other subjects reveals less definite and consistent contrasts But it can be said that scarcely a trace is to be found among American writers of belief in the wage fund theory (long before Francis A. Walker's later repudiation of it), or of belief in a fatalistic downward trend in the standard of living for the masses (an "iron law of wages") Such ideas were too strongly contradicted by the prevailing trends in popular welfare (despite repeated financial depressions), and they were incompatible with the optimistic spirit in America.

Least departure from orthodox views was shown in general value theory Most American writers, led by the nationalists, out-Heroded Herod in their professions of belief in the labor theory of value and in labor costs as determining all prices, although often inconsistently resorting to the saner idea that prices are determined by demand and supply in the market, by what *commodities will bring- rather than by what* they have cost. Two laudable exceptions were Phillips (a nationalist) and Tucker (a free-trade writer), who independently anticipated the modern theory of subjective value, conceiving of valuations as essentially reflecting present desires rather than past costs. Henry C Carey and his disciples substituted a "cost of reproduction" for the "cost of production" doctrine, which is at least a step toward a present-demand, rather than a past-cost, theory of prices

Here our story must break off just as the plot thickens. Is it possible to pass any general judgment on the American political economy of the period we have surveyed? Charles F. Dunbar, in 1876 (*North American Review* 122: 140, 1876), recorded his pessimistic conclusion as follows. "The United States have thus far done nothing toward developing the theory of political economy" Dunbar, a man of undoubted ability, had been a student of law and a business man until, at the age of 39, with no special schooling in economics, he was appointed to a professorship of political economy at Harvard His limited writings on money and banking became noteworthy, but *his general economic conceptions* had been derived from the orthodox English school, as formulated in 1848 by John Stuart Mill with some admixture of a newer social philosophy and a more optimistic outlook. It may well be the long-run verdict of history that in those very matters in which the characteristic views of American political economists differed most from those of the contemporary English school in the first half of the nineteenth century, they came nearer to the ultimate truth Dunbar explains the alleged failure of American political economy as "a natural effect of environment," by which vague phrase he seems to mean that the urgent practical problems of the new country left no time for original thought It may be contended on the contrary, that the natural effect of a new environment is to stimulate to explanations more fitting the new reality The question worth asking, therefore, is not, why did early American political economy fail utterly in originality; for it did not utterly fail. The pertinent question is, rather why did the fertile and original conceptions which sprang, as it were, spontaneously *from the new environment in America*, not come to fruition in a constructive and more lasting system of American economic thought?

Two obstacles long stood in the path of productive thought on economics in America. One was false authority, mistaken regard for economic theories conceived *ad hoc* in England to explain essentially different and distinctly abnormal conditions. The other was partisanship, which blocks the path to disinterested scientific effort whenever personal prejudices and pecuniary or class interests are affected by the application of any kind of theory to practical problems. American political economy has suffered in both these ways. On many American students of political economy the false authority of English orthodoxy has rested like a dead hand The views of the other group, the nationalistic school, were largely determined, no doubt in large measure unconsciously, by political prejudices and by the pecuniary interests of tariff beneficiaries

Perhaps it must always be so in some measure As long as men allow their thought to be dominated by false authority and by their material interests and selfish likes and dislikes, political economy cannot be a purely objective science The best that can be done is to minimize the evils by developing the judicial and scholarly spirit in the social studies. For this is needed specialized training, a slow process of public education, a changed public opinion, and social institutions to safeguard intellectual independence Surely some progress in these respects has been made in the last 75 years.

It is a remarkable fact that during the whole period before 1870 there was not a single so-called political economist who had received the minimum amount of special training demanded today for the practice of law, or of medicine, or for the pursuit of the natural sciences All were trained primarily in some other field: theology, moral philosophy, literature, languages, law, practical politics, journalism, business, or some branch of natural science. In political economy they were all self-trained amateurs, who, as it were, happened to wander into this field. If the study of the more exact sciences were pursued only by men with such dominant motives and such unspecialized training, little scientific progress could be expected Perhaps this is the main moral of our story Another outcome of special interest to this company may be a fuller appreciation of the part taken by members of the American Philosophical Society in speculations on political economy during the first century of our national history

CONTRIBUTION TO THE HISTORY OF PHYSICAL ANTHROPOLOGY IN THE UNITED STATES OF AMERICA

WITH SPECIAL REFERENCE TO PHILADELPHIA

ALEŠ HRDLIČKA

United States National Museum

(Read November 20, 1942)

THE history of probably every branch of science is much like that of a tree. It needs appropriate ground, but its seed may be brought from far away, and beneath what will appear above the ground there is a complex of unseen roots. The actual emergence of the plant, however, may on occasions be witnessed, or at least dated, and such is the case with Physical Anthropology in this country. Its seeds were brought from abroad, they began to germinate in several places in this country, but the actual birth of the science took place in Philadelphia, in the late thirties of the nineteenth century, and its progress had some intimate associations with the American Philosophical Society. It begins with the researches on American and other crania by Samuel G. Morton. Its roots lie in Anatomy, the incentives for its special development in the early physiological "Phrenology," and in the initial racial studies.

Before proceeding further it will be necessary to make clear what Physical Anthropology is. It may most briefly be defined as that branch of the study of man which deals in a comparative way with his physique as well as his functions, for basically the two are inseparable. It is the advanced, comparative, human anatomy, physiology, chemistry, and even pathology--in a word, comparative human biology. Its distinguishing character from ordinary anatomy, etc., is the *comparative* element, within the human species. It is the comparison, in all the above respects, of human groups, together with the studies of man's origin, evolution, and differentiation, its ultimate objects being through the knowledge of the biological man's past and present, in all his variations, to throw light on his future progression.

Being what it is, it was inevitable that its initiations should originate with the anatomists. Anatomical teaching in Philadelphia begins, and that at first only in a private school (Thomas Cadwalader's), in 1750. As the first professional anatomist of the city may be regarded William Shippen, who, though at first (1762–1775) also teaching the subject privately, in 1765 is instrumental in establishing the School of Medicine of the Pennsylvania College, from which developed that of the University of Pennsylvania. From 1808 to 1818 this chair is held by Caspar Wistar, and with him (and Horner) begins the first collection of anatomical specimens and preparations, which develops into the Wistar and Horner Museum, and leads eventually to the establishment of the Wistar Institute.

Thus far there was no Anthropology, conditions were not yet ripe for it. Anatomy alone was still barely established, and so was Physiology. It is only in the thirties of the nineteenth century that a need of research in the advanced direction begins to be felt and Philadelphia, in the person of Samuel G. Morton, becomes the pioneer city of such studies.

Of Samuel G. Morton there are several biographies, though all are more or less wanting. He was born in Philadelphia, January 26, 1799, of an Irish father and an American mother. His father died when Samuel was but six months old, and the boy was brought up largely and educated in the Friends' boarding schools. At the age of 16 he was apprenticed to a firm of merchants in Philadelphia, but his interest lay in natural studies. During his mother's last illness, in 1817, he came in contact with the several physicians who attended her, through them became interested in medicine, and as a result entered the office of the renowned Dr. Joseph Parish, from whom he received the initial needed instruction. Soon afterward he began also to attend the courses of the Medical School of the University of Pennsylvania, from which, in 1820, at the age of 21, he received a medical degree. Feeling the need of further education, and in accordance with the custom of the time,

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 1, JULY, 1943

he left after that for Scotland, where in 1823 at the University of Edinburgh he received the degree of Doctor of Medicine.

During his stay abroad Morton became acquainted with the then new and stimulating work of Blumenbach on human crania, and with that of the early physiological "phrenologists" who, having become aware of the motor centers in the brain, conceived and propagated the theory that since there were definite motor centers, there must also be those for other, mental, brain functions, and that when well developed such centers left a recognizable mark on the skull This attractive theory, though since then proven erroneous, had at that time, under the influence particularly of Gall and Spurzheim, numerous prominent adherents both in Europe and in America, was adopted by Morton, led him to a vast amount of both collection and work which otherwise he would probably never have engaged in, and made of him at the same time the first American physical anthropologist.

Morton's inclination to natural studies had led him in 1820 to join the Academy of Natural Sciences of Philadelphia After his return this connection was reestablished, to last all the rest of his life. In 1831 he became the corresponding secretary of the Academy, in 1840 its vice-president, and in 1849 its president, and it was the Academy that in 1851, upon his death, acquired his highly valuable collections

After his return from Europe Morton started a private practice in his city, and in 1830 he began also teaching anatomy in two of the early medical schools of Philadelphia In 1834 he made, for his health largely, a trip to the West Indies. Since the beginning of his teachings, however, he also commenced to gather, largely at his own expense, a collection of the crania of American aborigines, with those of other races He was brought to this partly by the realization that, when he wished to demonstrate to his pupils the racial differences in the skull, he was unable to find specimens with which to do so, but evidently even a stronger motive was his desire to test on the skulls of the different races the promises of "phrenology"

Between 1830 and 1839 Morton must have devoted a very large part of his time to the gathering of his collection, to anthropological reading and technique, to the working up of his collection, and to the preparation of the extensive data and illustrations for publication. Of all this there is no record, except what is reflected from the preface and the introduction of his great work, *Crania Americana*, published in 1839[1] This volume, while marred by the "phrenological" illusion, is in many ways an astonishing and unique production of its time. Its many plate illustrations have never been excelled, its anthropometric portion is admirable and in a large measure astoundingly sound, and the whole work is a classic in American Physical Anthropology I have dealt with this subject in more detail in another place[2] What may be added here is that in the preparation of the work Morton was materially aided by John S Phillips, Esq, comember in the Academy of Natural Sciences of Philadelphia, and that, while bringing him much posthumous honor, the great work in his life caused him much grief This resulted from his expressed inclination to the views of the "polygenists," who believed that while all present humankind belonged to one species, the different races of man had separate origins, or, in Morton's words (*Crania Americana* 3), that "each Race was adapted from the beginning to its peculiar local destination," and that the "physical characteristics which distinguish the different Races, are independent of external causes" This position, which had an untoward bearing on the question of the Negro in this country, brought Morton tribulations which blighted what would otherwise have been a great gratification of his career.

Morton kept on, however, working in anthropology. He published in the next twelve years upwards of twenty other contributions to the subject,[3] the most important of which was a volume on *Crania Aegyptiaca* (Philadelphia, 1844), and an article "On Hybridity of Animals, Considered in Reference to the Question of the Unity of the Human Species" (*Proc Acad Nat Sci Philadelphia*, 1848). All this in addition to his medical practice, his teaching of anatomy, and his preparation of a textbook on *Human Anatomy*

Yet Morton was not of a strong constitution. He suffered considerably from serious headaches, had a severe spell of illness while abroad for his studies, and was never robust. He died prematurely, in his fifty-third year, on May 15, 1851.

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[1] Philadelphia and London, f°. 297 pp, map, 72 pl., numerous text illustrations.

[2] *Physical anthropology, its scope and aims; its history and present status in the United States*, 8°. Philadelphia, 1919

[3] See writer's *Physical Anthropology*,

Before Morton's death his collection of crania numbered not far from one thousand specimens, exceeding in size all other similar collections then in existence, and shortly afterward was supplemented by a considerable further number of skulls which he had solicited during his life. This whole collection, which embraces invaluable series of fullblood specimens from tribes that subsequently either have become greatly admixed or have almost died out, became the property of the Academy of Natural Sciences of Philadelphia, where, dormant, it is stored to this day. In the Academy are probably also still unpublished details relating to Morton's scientific activities Both the collection and the details demand renewed attention

Morton left no direct disciples in anthropology, but his contributions greatly stimulated interest in the subject and gained followers. Among these were James Aitken Meigs (1829-1879), professor of physiology in several of the colleges in Philadelphia, Joseph Leidy (1823-1891), professor of anatomy at the University of Pennsylvania Medical School; and Harrison Allen (1841-1897), professor of zoölogy and comparative anatomy, later also of physiology, at the University Of the anthropological interests of these three also, we do not as yet know all that deserves to be known

Of the three, Dr. Meigs was the most direct of Morton's followers.

It was Leidy who after Morton's death was invited to follow in the studies on the collection, but not being able to do so, he confided the task to Meigs Even Meigs, however, could devote only a part of his time to these studies. He prepared a *Catalogue of the Human Crania in the Collections of the Academy*, which was a continuation of Morton's catalogue; and he contributed several papers on craniology and craniometry But his work in the field remained only an avocation.

Dr Leidy was a keen observer He remained interested in Anthropology, and contributed in course of time over a dozen papers of anatomico-anthropological interest, but his main activities were in collateral fields. American Anthropology owes to him the first clear authoritative statement on the unreliability of bone mineralization ("fossilization") as a criterion of antiquity

With Dr Harrison Allen we approach the modern period, for he was known in person to some of the still living workers. Born in Philadelphia, he graduated as M. D in 1861 from the Medical School of the University of Pennsylvania, served as a physician and surgeon in the Civil War, became in 1865 professor of zoölogy and comparative anatomy at the University, and later also for a time professor of institutes (mainly physiology), and in 1892 he became the first president of the Wistar Institute

Allen's anthropological interests lay partly in studies in craniology, partly in anatomical anthropology He furnished nearly 30 contributions to these subjects,[4] nearly all of which are of permanent value The most outstanding of these are "The Clinical Study of the Skull" (1890), "The Crania from the Mounds of the St Johns River, Florida" (1896), and "The Study of the Hawaiian Skulls" (1898) And he was largely responsible for the excellent exhibits of the Wistar Institute

The Wistar Institute of Biology and Anatomy was organized, under trustees of the University of Pennsylvania, on March 8, 1892 It was established, on the basis of an endowment by Gen Isaac J Wistar,

> for the purpose of forever sheltering, preserving and increasing the extent and usefulness of the Museum of Anatomical and other scientific objects belonging to the University, and commonly known as the Wistar, or the Wistar and Horner Museum, which was originally instituted by Dr Caspar Wistar, Professor of Anatomy in the said University between the years A D, 1808 and 1818, and was, by his widow, Elizabeth Mifflin Wistar, presented to the said University and has since been considerably increased by the labors and generosity of succeeding incumbents of the Chair of Anatomy and others.

Owing to circumstances the Institute has not thus far become directly a focus of anthropological research It preserves, however, some very valuable anthropological collections (cranial, skeletal, and brain), on which some work has already been done and published, and which form a potential nucleus both for greater collections and for research But the Institute has been and is now of inestimable value to American Physical Anthropology by serving repeatedly as a host to the annual meetings of the anthropologists, and above all by publishing, since 1927, the *American Journal of Physical Anthropology*, the foremost periodical now in this branch of study.

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[4] See writer's *Physical Anthropology* 61-62.

Besides all the preceding, Physical Anthropology in Philadelphia has counted since Morton's time a number of additional workers and contributors These include George R Gliddon, co-author of Nott and Gliddon's once famous *Indigenous Races of the Earth*, Dr Daniel G Brinton, at one time curator of the collections of the American Philosophical Society; Clarence B Moore, the archaeologist, who contributed to physical anthropology some of its best collections from Florida, Kentucky, Arkansas, and Louisiana, William C Farabee, student of the tribes of northern South America, and later George A Dorsey, formerly of the Field Museum, Chicago, both connected for a time with the University Museum of Philadelphia, Dr W L. Abbott, of this city, the outstanding biological explorer and collector of Malaysia, Ernest W Hawkes and Ralph Linton, both connected for a brief time with the University Museum, Dr E A Spitzka, a distinguished brain student and professor of anatomy at the Jefferson Medical College, and last but not least Dr Henry H Donaldson, director of research at the Wistar Institute and one of the vice-presidents of the American Philosophical Society, whose work on *The Growth of the Brain* (12°, London, 1897) and other contributions to the subject are landmarks in anatomy and anthropology [8]

CONCLUDING REMARKS

The main object of this brief presentation was not so much to cover the origin and progress of Physical Anthropology in Philadelphia, which I have already done in more detail in my *Physical Anthropology* (published by the Wistar Institute), as to call attention to the need of gathering, while there may yet be time, many of the still submerged details relating to the history of the branch in this city The men whom I have enumerated, from Morton to Donaldson, have in a large measure been connected with the American Philosophical Society, with the Academy of Natural Sciences of this city, the Medical School of the University of Pennsylvania, the Museum of the University, the Wistar Institute, and one or two other establishments. In the archives of these different bodies, and in their libraries, there may doubtless be found to this day correspondence and other documents, an examination of which would reveal points of interest connected with the anthropological developments in this city Philadelphia may well be proud of the records in this connection, but "noblesse oblige"—it is up to Philadelphia to complete these records It would be most fitting, I think, if the American Philosophical Society, with which the principal men here dealt with, from Morton on, were intimately connected, took the needed steps towards completing the history of Physical Anthropology in this city, with the help perhaps of one of its scholarships It would be to its lasting credit

The second main object of this communication is to bring home to the institutions in Philadelphia, and particularly perhaps the University, the present neglect of the branch which was born in this city and started so auspiciously. Physical Anthropology is human biology It is the study of the origin, evolution, and differentiation of Man, with the laws that underly them, with the object that it may benefit Man's future A vast amount of its work remains still to be done, both on skeletal materials and on the living The branch is like a pyramid standing on its tip and becoming ever broader as it rises It would surely seem worthy of active attention, as well as utilization, for it can give a great deal of sound mental material to the younger generations.

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[8] For more details and lists of relevant publications see my *Physical Anthropology*

AMERICAN GEORGIAN ARCHITECTURE

THOMAS JEFFERSON WERTENBAKER

Princeton University

(Read November 20, 1942)

ARCHITECTURE *is* history in brick and stone Who can view an old house or wander through its rooms without re-creating something of the life which once went on there, or gaining a new insight into the antecedents, economy, art, customs, and craftsmanship of the people it sheltered? This is true because architecture is not invented but develops, is the creation of a people, a life, a civilization If it is the architecture of the tobacco region, it must conform to conditions there—the climate, building materials, the slave economy, the plantation system, if it is the architecture of New England, it is molded by the severe winters, by the life of the fisherman, the small farmer, or the merchant, by the lack of lime, the abundance of timber

Not only is architecture revealing, but often much remains to guide the historian when manuscripts are missing How thrilling are the discoveries of Professor T Leslie Shear and his associates in their excavations of the Agora! The work going on at Jamestown would make possible the restoration of that cradle of the republic with a remarkable degree of accuracy The unearthing of hidden foundations, of broken tiles, of casements, of little diamond-shaped panes, of hinges, of ceiling decorations, are all of great interest John D Rockefeller, Jr, in his epoch-making work at Williamsburg, did more than re-create old buildings, he re-created a civilization

Nothing could be more misleading than the oft-repeated assertion that colonial America created no architecture The dawn of the eighteenth century found a number of distinctly American architectures—of Massachusetts, of Connecticut, of the New York City and Albany regions, of the Flemish regions of New Jersey and Long Island, of southern New Jersey, of Philadelphia, of German Pennsylvania, of Maryland, of Virginia, of the Charleston region. This diversity was partly the result of diverse origins, partly of diverse local conditions The little cottages of tidewater Virginia differed from those of northern New Jersey chiefly because the Virginians were English while the north Jerseymen were Flemings But the Virginia cottages differed from those of Massachusetts because of differences of soil, climate, and the life of the people

Typical of the dwellings of the Virginia planter of moderate means was the so-called Adam Thoroughgood house, Princess Anne County, Virginia (fig 1) Clearly derived from the Flemish type of East Anglian cottage, it had taken on a character of its own so distinct that it would have been out of place at Cambridge or at Ely The central hallway with stairs, the combined kitchen and dining-room on one side and bedroom on the other, the loft, the plain front door slightly off-center, the irregular end chimneys, one interior and one exterior, the Flemish bond, are all typical

More pretentious, because the residence of a well-to-do family, is the Arthur Allen house, the so-called Bacon's Castle, Surry County, Virginia (fig. 2) This building stands as the sole survivor of a type which seems to have been common—the Virginia Tudor The graceful Flemish gables, the ancient porch containing the porch chamber, the rear projection for the staircases, the towering Tudor stacks set diagonally on the chimneys, the battened doors, two of which survive, give distinction as well as charm to this old house It is to be hoped that it will be taken over by the Government or some historical society for restoration and preservation, for its destruction would mean the passing of one of the most interesting landmarks of American culture

There is every reason to believe that the New England cottage, like the Virginia cottage, had its origin in the small Flemish house of East Anglia, but its development in America was quite different The need of protection from the wintry blasts made the chimney the central feature, with considerations of room arrangement, height of ceiling, pitch of roof, etc, yielding precedence to it So, on the hills of Connecticut and the dunes of Massachusetts appeared thousands of frame cottages, with low roofs devoid of dormers, central chimney, a small entrance hall with bedrooms to right and left, and in the rear a large living-room

The two-story house, which was also an importation from East Anglia, was characterized by the overhang and dewdrop, casement windows, and numerous gables The frame construction to which the immigrants had been accustomed was adhered to, since timber in New England was plentiful, but it was found necessary to give up half-timbering in favor of boards or shingles. Lime was lacking with which to harden the mixture of clay and straw used as a covering for the wattle between timbers, and without it the walls could not resist the hard rains and the cold of winter.

Contrasting strangely with both the Virginia and the New England cottages were the houses of the Germans of southeastern Pennsylvania and of the southern back country. Since many of these hard-working peasants and artisans had dwelt for generations in log houses, it was inevitable that they should build log houses in the woods of America But they brought, also, the distinct half-timber and stone architecture of the Rhine Palatinate whence most of them came The quaint old Herr house near Lancaster (fig 3), with its sharply rising roof, the small windows, the absence of dormers, the central chimney, the carefully laid stones, carries us back to Rohrbach or Schifferstadt.

Turning now to the lower Hudson valley, we find two types of cottage, the Dutch and the Flemish, differing sharply from each other and from American houses elsewhere The Flemish cottage, easily identified by its "flying gutter" or overhanging roof, its steep roof, end chimneys, and narrow depth, made its way into northern New Jersey, Westchester, Manhattan, and western Long Island, retaining its European form for more than a century, but discarding the old clay walls in favor of timber or brownstone, and thatch in favor of shingles (fig 4). The Dutch house, on the other hand, with its fascinating gable ends, its finials, its ornate beam anchors, its tiled roofs, its colored bricks, remained almost unchanged until it was forced to retreat before the Dutch Renaissance architecture and the English Georgian (fig. 5).

It was Philadelphia which had the distinction of being the first Renaissance city in America. Since it was founded at a time when all England was interested in the new London, rebuilt after the fire of 1666, in the new style, it was inevitable that Penn and his followers should have patterned their houses upon those so recently erected on Thames Street or Cheapside (fig. 6). The so-called Letitia house (fig 7), restored and removed to Fairmount Park, and the Carpenter mansion (fig 8), which stood on Chestnut Street, are typical—the one of the small city cottage, the other of the more pretentious house They show the penthouse, or inter-story cornice, while the Letitia House has the door hood, both almost universal in the early Quaker American architecture.

Thus, with the opening of the eighteenth century the colonies could boast, not of one American architecture, adhered to by all sections, but of several distinct architectures The New England frame house would have seemed strange amid the tobacco fields of Maryland or Virginia; the German stone or half-timbered house would have been a curiosity in Connecticut, to the Pennsylvania ship captain who sailed into New York Harbor, Manhattan seemed as foreign as Amsterdam or Delft

Had the colonies been culturally independent of the mother country, this diversity no doubt would have continued indefinitely, each type becoming more and more individual as local conditions brought modifications But the contact with England became closer, the impulse to imitate English styles stronger. The colonists modelled their furniture after English furniture, their silverware after English silverware, their houses after English houses When English books on architecture made their appearance in the colonial bookshops, the local builders were forced to study the designs shown in them and to base their work upon them James Gibbs's *A Book of Architecture*, Batty Langley's *City and Country Builder*, and similar works set the style in every urban center from Boston to Charleston. The movement was accelerated by the immigration of architects from England and by the educating of local builders in the mother country In New England, in New York, in Pennsylvania, in Maryland, in Virginia, in the Carolinas, the old styles gradually gave way to the Georgian, and there came for the first time a large degree of uniformity to American architecture

Complete uniformity, of course, was impossible because local conditions were far from uniform. The Georgian was no more immune to the influence of climate, building, materials, social customs, and economic life than had been the architectures of the various immigrant groups. In time there developed the wooden Georgian of New England, the Philadelphia Georgian, the stone Georgian of New Jersey and parts of Pennsylvania, the Virginia Georgian, the Charleston Georgian, etc These children of the English style all resembled the parent, all resembled each other, but they were as easily told apart as are the individual members of a family.

The Philadelphia Georgian was shaped in part by the famous Carpenters' Company, founded in 1724, which included the leading architects and builders of the city. Their *Manual*, with its plans, elevations, windows, transoms, doors, mantels, and dormers, became the standard work for the region. One has only to compare the mantel shown in the *Manual* (fig 9) with those of Woodford, the Powell house, or Belmont (fig. 10), or the Doric door with the front door of Cliveden, to recognize the wide-spread influence of this little volume. It was the repeated use of certain details, known elsewhere but not in such universal vogue, rather than the introduction of any original feature, which made the Philadelphia Georgian distinctive the Palladian window, the Doric door, roof urns, ornate dormers, interlocking mullions.

Perhaps the finest illustration of the Philadelphia Georgian is beautiful Mount Pleasant, famous for its associations with Benedict Arnold and his bride, Margaret Shippen. The cut stone with heavy brick quoins, the great arched chimney stacks, the pedimented Doric doorway, the central Palladian windows, the hipped roof, the ornate dormers, not only give an ensemble of remarkable charm but denote the architectural school to which the building belongs (fig. 11) Typical, also, and even more famous, is the tower of Independence Hall. The Hall itself was built before the Georgian had become ascendent in Philadelphia, but the tower, which was added sixteen years later, with its Doric door, the Palladian window above it, the Ionic pilasters of the second and third sections, the Corinthian pilasters of the wooden fourth section, the arched belfry, shows the new style at its best (fig. 12)

In the Philadelphia Georgian style was Nassau Hall, of the College of New Jersey, at Princeton, N. J., which was designed by Robert Smith, of the Carpenters' Company, in collaboration with Dr. William Shippen. The classic front doors, the roof urns, and the cupola easily identify it, despite the extreme simplicity of the design and the details and the use of uncut stone thinly disguised by rectangular mortaring The cupola is a replica of the upper part of the cupola of St. Mary-le-Strand, London, taken from Gibbs's *A Book of Architecture*

It was Sir Christopher Wren who introduced Renaissance architecture to Virginia by designing the main building of William and Mary College. "The building is beautiful and commodious, being first modelled by Sir Christopher Wren [and] adapted to the nature of the country by the gentlemen there," wrote Hugh Jones, one of the professors To the colonists, accustomed to the Virginia cottage or the old Virginia manor house in the style of Bacon's Castle, the college must have seemed imposing and beautifully proportioned Today, after its restoration to its original form, the visitor to Williamsburg catches the spirit of the Renaissance in the quaint sash windows, the rows of dormers, the stairs leading up to the front door, the balcony above, the hipped roof, and the graceful cupola (fig 15)

Even more influential than the Wren building in shaping the development of eighteenth century Virginia architecture was the Governor's Palace. Turning to Johannes Kip's *English Houses and Gardens*, we find many late seventeenth-century mansions, with their surrounding gardens, which are strikingly like this building In fact, we are tempted to believe that the architect deliberately picked out one of them, let us say Eaton Hall, near Chester, and used it as his model, for not only do we find the same type of façade, classic door, hipped roof, towering chimneys, dormers, roof balustrade, and cupola, but the front court flanked by outbuildings, the formal side gardens, the summer houses, etc. (figs. 13 and 14). It was the palace which set the style for the pretentious houses of the wealthy planter in the first half of the eighteenth century. Westover, Carter's Grove, Eltham, the Wythe house, and others, while not identical in detail, show unmistakably the influence of this beautiful building

More purely Georgian, and not less beautiful, was the style developed at Annapolis and its immediate vicinity. Here a school of architects, of whom William Buckland is the best-known, designed a group of buildings which for correctness of proportion, dignity, and charm were unsurpassed in America. The central pavilion, the high chimneys, the balancing wings, the absence of shutters, the salmon-colored brick, the flush trim and heavy muntins of the windows, the delicacy of the woodwork, set the Annapolis Georgian apart from the Philadelphia Georgian or the Virginia Georgian Perhaps the most perfect example is the Hammond house (fig 16)

It remained for Virginia to develop a type of church architecture the most unique, the freest from English influence, of any in America The Virginians would have none of Sir Christopher Wren as a designer of church buildings Though subservient culturally to London, they would not imitate St Mary-le-Bow or St Clement Danes, possibly because the clergy thought the Renaissance style with its classical ornamentation unsuited for houses of worship Bruton, in Williamsburg, St Paul's, Norfolk, Blanford, Petersburg, were but elaborations of seventeenth-century Virginia churches, which in their antecedents were clearly Gothic (fig. 17) This was the situation at the end of the first third of the eighteenth century, when some architect, or group of architects, broke sharply with tradition to create what may properly be called the Virginia Georgian church Lacking towers or steeples, built in some cases in the form of a Greek cross, in others of a rectangle, the walls of brick laid in the Flemish bond, with two tiers of windows, low roof, ornate cornices, classic doors, they resemble private residences more than churches Certainly Pohick, near Mount Vernon (fig 18), Christ Church, Alexandria, Falls Church, Acquia Church (fig 19), St Paul's, King George County, constitute a group of remarkable originality and charm.

In the far South Georgian architecture conquered the Charleston region, where the growth of a wealthy class made it especially appropriate, just as it had conquered elsewhere The styles which had previously developed there through tradition and local conditions either gave way completely or were modified to bring them into the "modern taste." The old narrow Charleston house with the entrance on the long side overlooking the garden and half hidden by a two or three story piazza had to be remodelled entirely So the architects made the narrow street end as ornate as possible with quoins, flat arches, and marble bands, and inserted a classical door opening from the piazza directly upon the street. It was this door which made the Charleston Georgian unique, but other features, such as the piazza itself, the high ceilings, the shutters, the elevated basement, all dictated by the summer heat, added to its individuality (figs. 20 and 21)

In New England the closer political, economic, and cultural ties with England which characterized the eighteenth century were reflected in the architecture of that region, the unique houses of the earlier period giving way to an interesting and charming interpretation of the Georgian The overhang and dewdrop, the casement windows, the central chimney, the great expanse of back roof disappeared in favor of the balanced façade, the classic central door, the roof pierced by dormers and perhaps set off by a balustrade. The arrangement of rooms was simple—a central hallway flanked by two rooms, between which rose the chimneys In the country villages, where transportation difficulties made lime for mortar costly, the architects developed a Georgian in wood which was as pleasing as it was unusual In the larger seaports, however, construction was largely in brick In Boston most of these old houses have disappeared, but in Salem, Portsmouth, Cambridge, and elsewhere many remain to prove that the New England Georgian was not less charming, not less distinctive than the Georgian of other colonies (fig. 22).

At first sight the conquest of America by Georgian architecture would seem to prove its complete subserviency to English culture and its inability to express its own life and taste in brick and stone and wood In fact it proves the contrary, for the colonist built, not English Georgian houses, but American Georgian houses With the standard books on architecture in hand, the American builders so modified the plans shown in them as to meet their own requirements of climate, building materials, cost of construction, etc. Nassau Hall in its original form was a purely Georgian building, yet its rough stone walls would have made it seem out of place in London or Oxford, William and Mary College was hardly recognizable as the work of Sir Christopher Wren, because it was necessary to modify his plan in conformity with the needs of Virginia.

Thus the history of American colonial architecture is the story of conflict between European traditions together with changing English styles and local conditions in America, conditions which were by no means uniform With the brushing aside of the various seventeenth-century archi-

FIG. 1. So-called Adam Thoroughgood house, Princess Anne County, Va.

FIG 2 Baron's Castle, Surry County, Va.

FIG. 3 Christian Herr house, near Lancaster, Pa.

FIG. 4 Old house, New Lots Road, Brooklyn, N. Y. (From Pictorial Archives of Early American Architecture, Library of Congress.)

OLD DUTCH HOUSE IN WILLIAM STREET
Built 1648—Modernized [illegible]

FIG. 5 Old Dutch house in William Street, New York

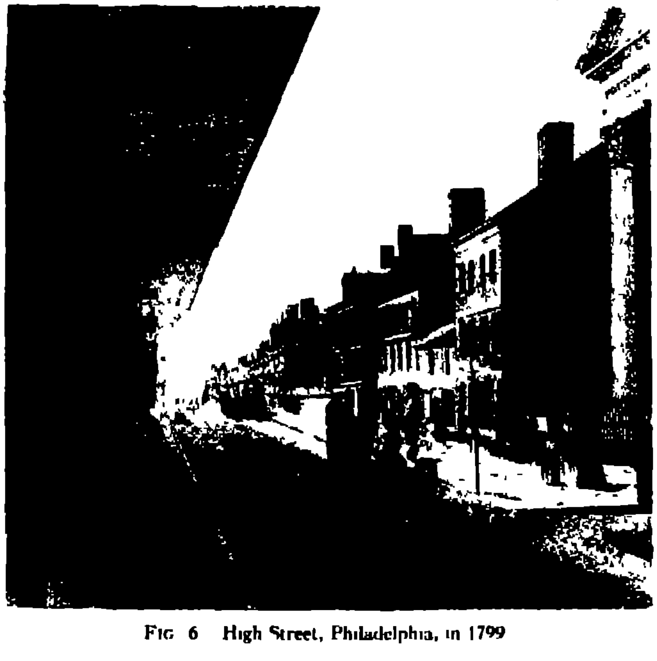

FIG. 6 High Street, Philadelphia, in 1799

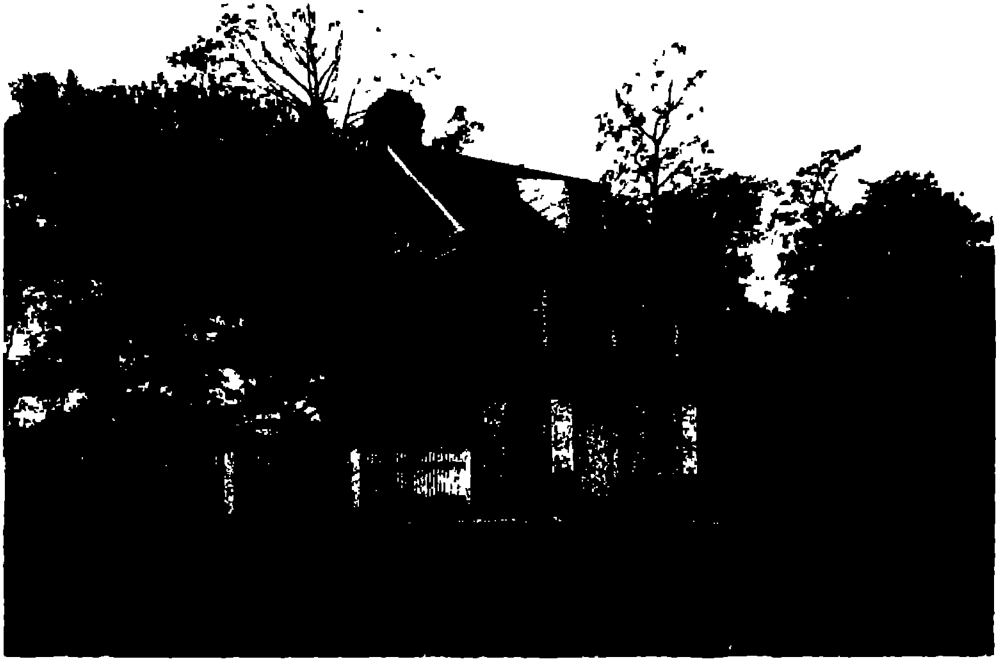

Fig. 7 Letitia house, now in Fairmount Park, Philadelphia

Fig 8 Carpenter mansion on Chestnut Street, Philadelphia
(From Watson, *Annals of Philadelphia*, Vol 1)

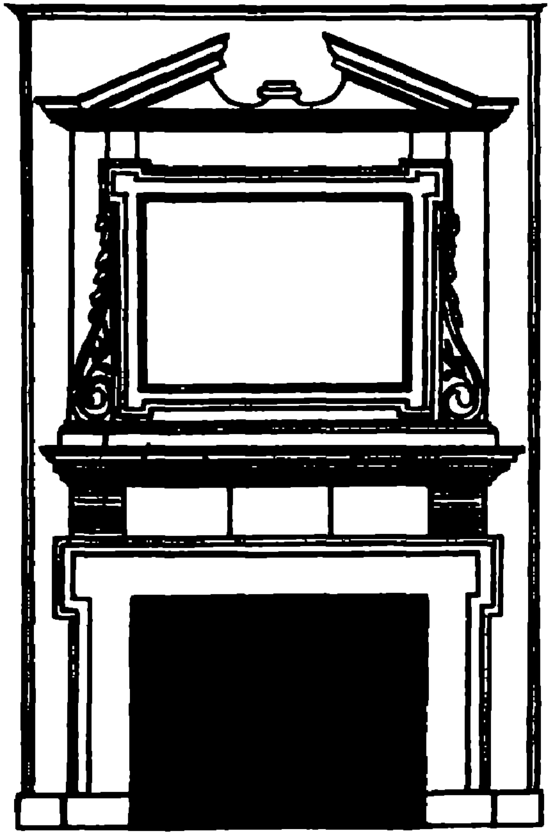

Fig. 9 Mantel, from *Manual* of the Carpenters' Company, Philadelphia

Fig. 10 Mantel in Belmont, Philadelphia
(Courtesy Architectural Book Publishing Company)

FIG. 11. Mount Pleasant, Philadelphia (Courtesy Architectural Book Publishing Company)

FIG. 12. South front, Independence Hall, Philadelphia

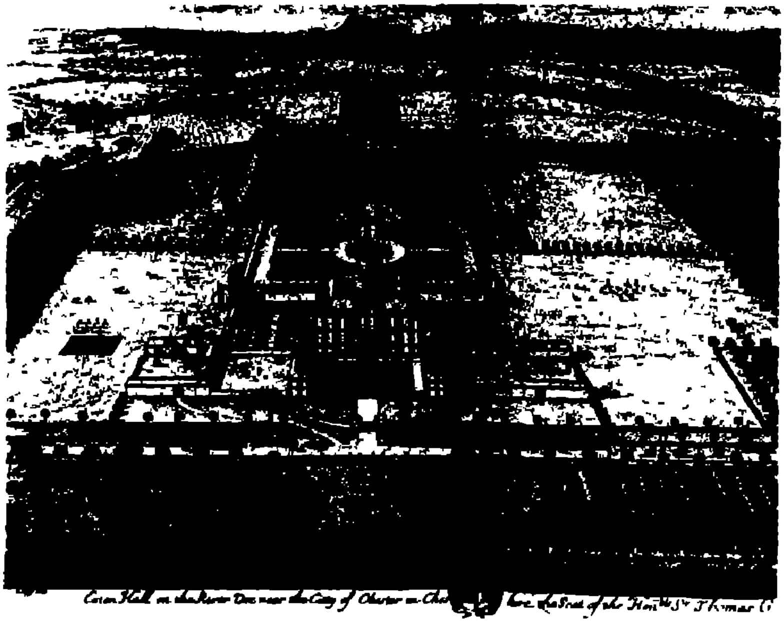
Eaton Hall on the River Dee near the City of Chester in Ch ... the Seat of the Honble Sr Thomas G

FIG. 13 Eaton Hall, near Chester, England

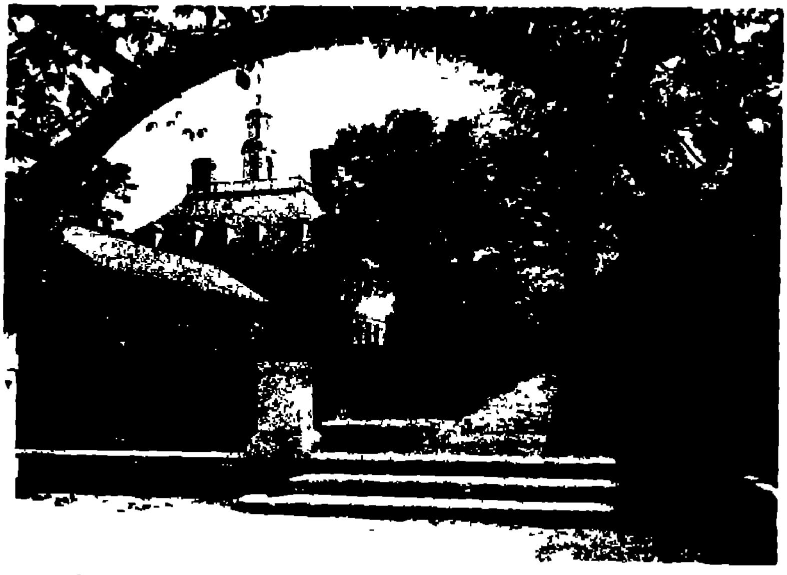

FIG. 14 Governor's Palace from the north garden, Williamsburg, Va
(Copyright, Colonial Williamsburg, Inc.)

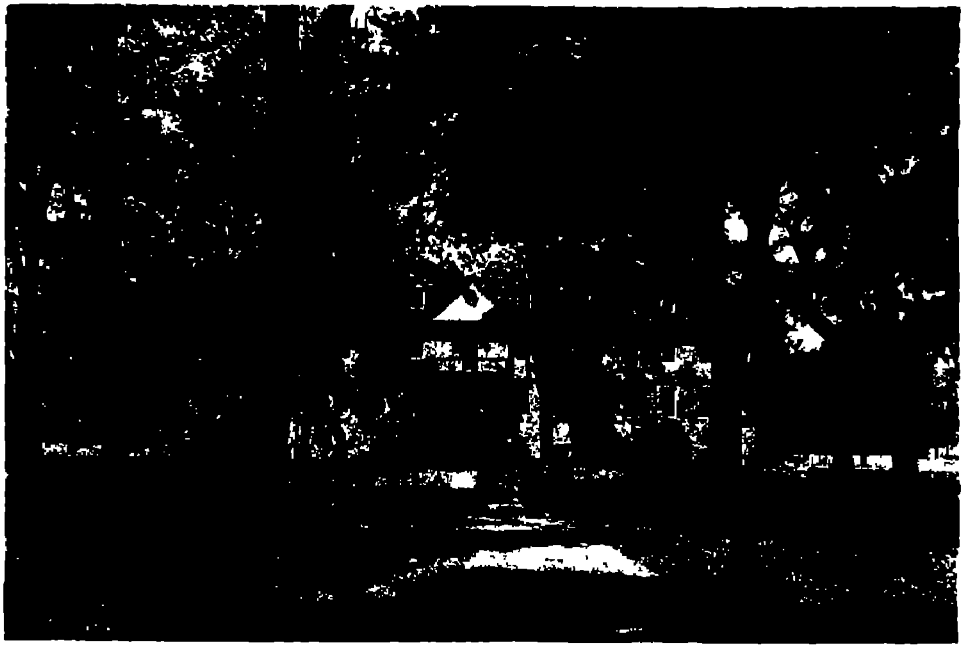

Fig. 15 Sir Christopher Wren Building at the College of William and Mary, Williamsburg Va This structure, dating from 1695 is the oldest academic building in the United States It has been restored as part of the restoration of Colonial Williamsburg by Mr John D Rockefeller, Jr (Copyright, Colonial Williamsburg, Inc)

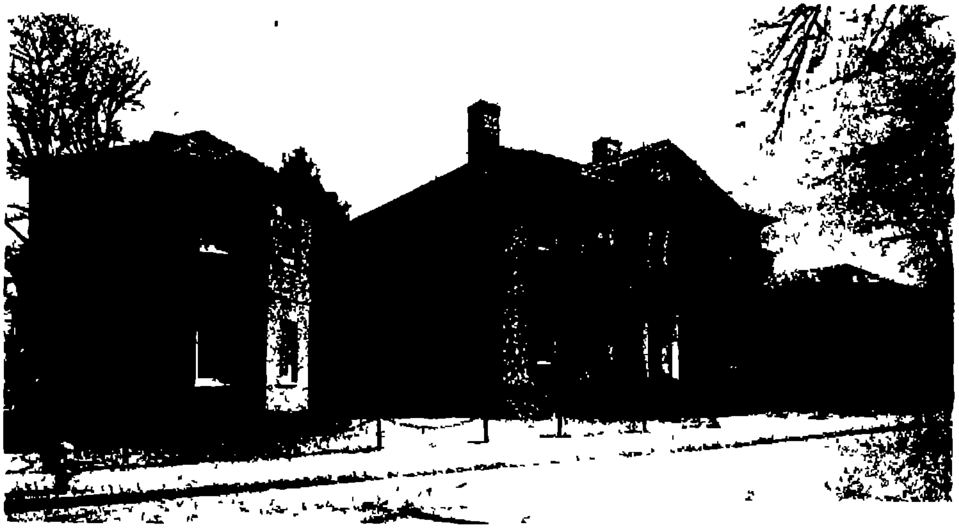

Fig. 16 Hammond house, Annapolis, Md

Fig. 17 Bruton Parish Church, Williamsburg, Va. Erected in 1710-15, this is said to be the oldest Episcopal church in continuous use in America. (Copyright, Colonial Williamsburg, Inc.)

Fig. 18 Pohick Church, Fairfax County, Va.

Fig. 19 Acquia Church, near Fredericksburg, Va.

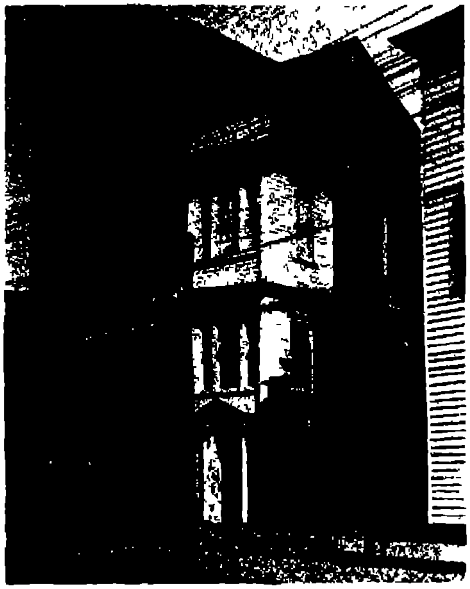

FIG 20 House in Charleston, S C (From Pictorial Archives of Early American Architecture, Library of Congress)

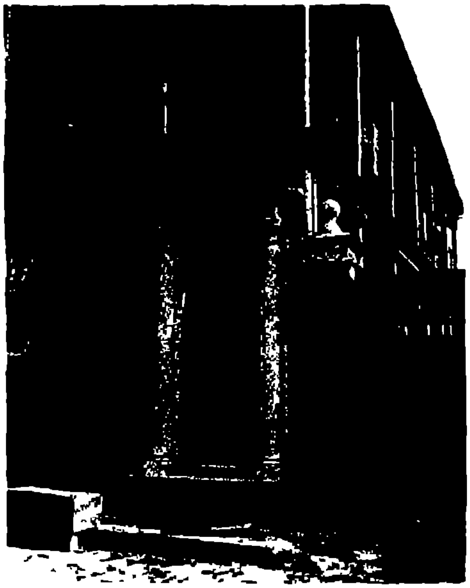

FIG 21 Porch door, Henry Manigault house, Charleston, S C (From Pictorial Archives of Early American Architecture, Library of Congress)

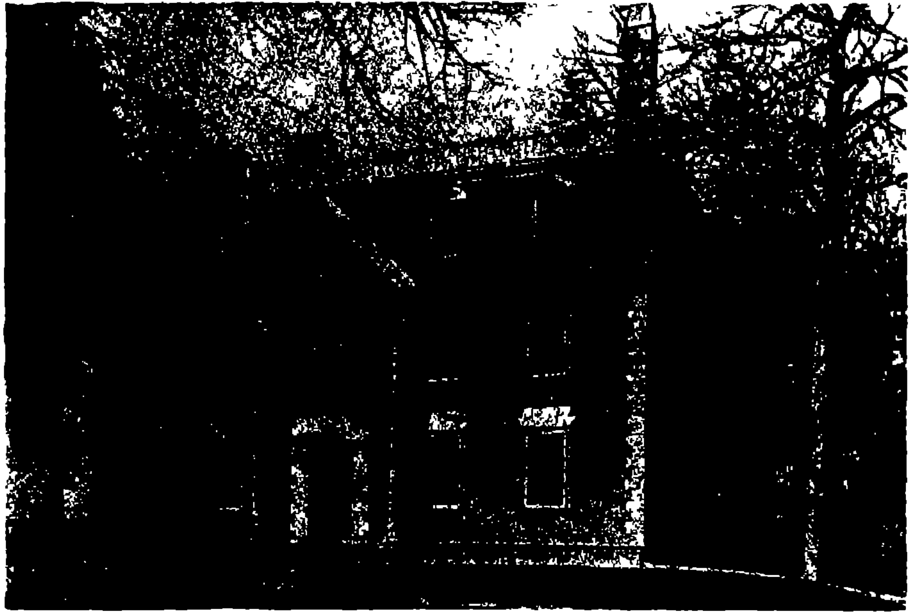

FIG 22 "The Lindens," Danvers, Essex County, Mass (now moved to Washington, D C) (From Historic American Building Survey, Library of Congress)

tectures, there came a degree of unity unknown before. But this unity was expressed along broad lines, which could not conceal fundamental diversity. The Hammond house is a perfect example of the Georgian, but there is nothing like it in Boston, Mount Pleasant would be on foreign soil were it placed on the banks of the Ashley, the Rutledge house would seem fantastic in Philadelphia Cultural independence for America was slow in coming, much slower than political independence, but cultural individuality has been here from the first

EARLY AMERICAN STUDIES OF MEDITERRANEAN ARCHAEOLOGY

WILLIAM B. DINSMOOR
Columbia University

(*Read November 20, 1942*)

IN UNDERTAKING to reconstruct in brief outline the story of the darkness before the dawn of American studies of Mediterranean archaeology, I am most painfully aware that we are about to explore paths for the most part untrodden or disconnected, and that for this reason our survey can be no more than a rough sketch The histories of the various fields of archaeological study, Biblical, Egyptian, Mesopotamian, Aegean, Greek, or Roman, clearly bring out the fact that, as seen in world-wide perspective, American efforts began to make themselves felt only after 1880, and began to equal and in some cases even to surpass those of their European colleagues only during the present century, long after the period with which this program is concerned In the period before the Civil War one American archaeologist alone, Edward Robinson, assumed international stature in the field of Biblical archaeology[1] Even in so broad a field as that of classical studies as a whole, including literature, and coming down into the beginning of the present century, a British (though pro-American) survey in three stout volumes allocates only 21 pages to our continent[2] In fact, one who peruses the *Proceedings* of the American Philosophical Society, from 1743 to 1865, will observe a certain aloofness toward archaeological studies, apart from those pertaining to the ubiquitous American Indian, which was symptomatic of the whole country's attitude It is not, therefore, with spectacular and enduring landmarks of archaeological accomplishment that I shall have to deal, but rather with the slow preparation of the mind of a practical people, living intensively in a difficult present, for the luxury of delving into a remote past And, as I mention some of the names associated with this process, the fact that the membership of the Philosophical Society played a considerable part in it will become apparent.

PRELIMINARY CONTACTS

First, however, we may recede to a much earlier period than 1743, to the very beginnings of our colonial settlements For it is in Virginia that we encounter our first archaeologist, George Sandys, one of the undertakers named in the third Virginia Charter of 1611, and a colonist himself ten years later, coming out as uncle of the wife of the governor, Sir Francis Wyat, and as treasurer of the Virginia Company. Just after he left London, in 1621, the first part of his translation of Ovid's *Metamorphoses* had been published, and during his first five years in Virginia he completed this work, the first of the classics to be translated in America, though printed at London in 1626 More important for our present survey is a pre-American phase of his career for to Sandys was due *A Relation of a Journey begun An Dom· 1610*, published at London in 1615 in "Foure bookes, containing a description of the Turkish Empire, of Ægypt, of the Holy Land, of the remote parts of Italy and Ilands adjoyning" This was one of the most popular travel books of the seventeenth century, illustrated with engravings by Francisco Delaram, it passed through eight English, one German, and two Dutch editions before 1673[3] Sandys had left Venice on August 20, 1610, sailing around Greece and through the Aegean to Chios, Troy, and Constantinople, in January of 1611 he started south toward Egypt, where he illustrated "The Ægyptian Pyramides & Colossus" (fig 1) in great detail, showing also "The Entrance in to the Great Pyramis," and then visited the Holy Land, Cyprus, Sicily, Naples,

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[1] See p. 101

[2] Sir John E. Sandys, *A History of Classical Scholarship* 3 (Cambridge, 1908) 450–470

[3] First edition, as cited, London, 1615; new editions or rather reprints with identical pagination in 1621, 1627, 1632, 1637, later editions in 1652, 1658, 1673, Dutch translations in 1653, 1665, German translation in 1669. Extract. "Relations of Africa, taken out of Master George Sandys his larger discourse observed in his journey, begun Ann 1610," in Samuel Purchas, *Hakluytus posthumus or Purchas His Pilgrimes* 6 (Glasgow, 1905) 172–233 See also E S. de Beer, "George Sandys's Account of Campania," *Trans. Bibliog. Soc*, ser. 2, 17. 458–465, 1937

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO 1, JULY, 1943

and Rome, examining the antiquities in each place. At Rome he spent four days, "secured by the faith and care of Master Nicolas Fitz-Herbert, who accompanied me in the surveying of all the antiquities and glories of that city" Sandys was the first man in America to devote himself to literature and scholarship, and, through contact with him, his Virginia friends were brought into much closer touch with the civilization of antiquity than was possible in any of the more northern colonies By 1631, however, Sandys had returned to England

There were, from time to time, sporadic commercial contacts between the new colonies and the Mediterranean Thus, said Edward Randolph in 1676, the Boston merchants paid so little attention to British laws regulating trade that they even sent ships to Scanderoon (Alexandretta) in northern Syria

During these earlier years Italy was visited by only one artist who can claim association with America, that is, John Smibert of Edinburgh, who had studied in Italy for three years in 1717-20, coming to our shores in 1728. In 1735 he was obliged to sell at Boston the private collection of engravings of famous paintings that he had accumulated in Italy and France But he retained until his death the "Bustoes and figures in Paris plaster," the first casts to reach America, valued at £4 in the inventory of his estate in 1752.

Eighteenth Century: Beginnings of Archaeology

As Benjamin Franklin wrote in 1743,

> The first Drudgery of Settling new Colonies, which confines the Attention of People to mere Necessaries, is now pretty well over, and there are many in every Province in Circumstances that set them at Ease, and afford Leisure to cultivate the finer Arts, and improve the common Stock of Knowledge.[4]

The changed character of the new period, for which 1743 may be taken as the beginning, is evidenced in part by the titles of the books that began to appear in the private and also in the subscription or public libraries In several instances we meet the English translation of Montfaucon's *Antiquity Explained* in five volumes (1721–22) and its *Supplement* in two (1725). In 1767 Francis Hopkinson brought from London the "*Ruins of Athens*," obviously the first volume of *The Antiquities of Athens* published by Stuart and Revett five years before, and deposited it with the Library Company of Philadelphia, which soon acquired also Thomas Major's *Ruins of Paestum*

In the field of amusements and visual education, the general public encountered scenes from abroad in exhibitions of such contrivances as the "Moving Mashene" at New York in 1746, where John Bonnin's "Philosophical Optical Machine" was likewise shown in the winter of 1748–49 In the same category belongs the product of a seven-year labor of a nameless enthusiast, for in the New York *Mercury* of June 4, 1764, we are told that "Jerusalem, a View of that famous City, after the work of 7 Years, [is] To be seen at the House of Tho Evans, Clock & Watch Maker—an artful piece of Statuary" Evidently, therefore, it was a model, and as such it reappeared in the newspapers of 1790 to 1802, a "Panorama of Jerusalem, at Lawrence Hyer's tavern, Chatham St 62—the sight is most brilliant by candlelight"

The humble beginnings of colonial public museums, under the guise of "Wax Works," made their first appearance in 1749 in New York Nineteen years later we hear of such classical subjects as "Scipio before Carthage," and a little later of "a most elegant Piece of Wax and Shell Work the Scheme taken from Homer's Iliad," according to the newspapers of the day

As the Revolution drew to a close, museums in the more usual sense began to appear, though generally with little concern for Old World archaeology One of the first was The American Museum set up by Pierre-Eugène du Simitière, previously one of the curators of the American Philosophical Society, at his own house in Philadelphia in 1782. When Du Simitière died in 1784, the idea of a museum had already been adopted by the painter Charles Willson Peale, whose exhibition of portraits of noted personalities was already in preparation toward the end of 1783 To these he gradually added objects of natural history, beginning in 1784 with a stuffed swordfish, supplemented by his first specimens of the bones of "the Mammoth, or great American Incognitum, an extinct immense carnivorous animal" discovered in 1785, all exhibited in his house at the corner of Third and Lombard Streets, Philadelphia The increasingly scientific character of the collection led to its installation in the building of the American Philosophical Society in 1794, but eight years later it had out-grown this space and the Society was obliged to have most of the objects transferred to the upper story of Independence Hall, though some of the material, including the mammoth, remained in the building of the Philosophical Society until 1811 But the career of this Peale museum during the nineteenth century must be discussed in a later section

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[4] Franklin, *A Proposal for Promoting Useful Knowledge among the British Plantations in America* (Philadelphia, 1743).

The next of the American museums was the creation of John Pintard, of New York, as an offshoot of his idea for an antiquarian society For, the proposed society not having taken root in the *form which he desired, he managed to* persuade the newly formed "St Tammany Society in the City of New York" to undertake the project, as he wrote to Jeremy Belknap, "This being a strong national society, I engrafted an antiquarian scheme of a museum upon it " Thus plans were drawn up in June, 1790, for the "American Museum, under the Patronage of the Tammany Society or the Columbian Order," having "the purpose of collecting and preserving everything relating to the history of America, likewise, every American production of nature or art " And, "although the funds of the society are confined to American productions, the doors of the Museum are, nevertheless, open to voluntary contributions from every quarter " The Common Council of the city assigned a room in the City Hall for the purpose of the museum, and here it was installed under the care of Gardiner Baker, but in 1794 it was transferred to the Exchange on Broad Street In 1795 the Tammany Society, evidently tiring of the responsibility, formally transferred the museum to Gardiner Baker, with the condition that it be conducted forever under the name of the "Tammany Museum." When Baker died, the museum was transferred by his widow to 226 Greenwich Street in 1799[3]

Among the learned societies, such as the American Philosophical Society founded in 1743, the American Academy of Arts and Sciences chartered at Boston in 1780, and the Massachusetts Historical Society at Boston in 1791, cabinets of relics or antiquities were either planned or accumulated And the Corporation of Harvard College, on August 1, 1769, voted that "Philosophy Chamber (in Harvard Hall) be a museum for the reception of curiosities belonging to the College, to be in the care of the Librarian "

The earliest project for an academy of the fine arts, wherein works of art more strictly appertaining to our subject would normally have accumulated, started with the Chevalier Alexander M Quesnay de Beaurepaire, who had served in Virginia as a captain in the American army in 1777-78, and during the years 1780 86 maintained a somewhat precarious existence as teacher of the French language, dancing, and drawing at Philadelphia and New York Soon he broadened his scheme to a plan for "the Academy of the polite Arts," with three scholarships in painting to be awarded every fourth year for study in Italy The scheme rapidly grew to one of national proportions Quesnay shifted the center to Richmond, where in 1786 he erected with popular subscriptions a wooden building to serve as headquarters. But Thomas Jefferson was skeptical "I feared it was too extensive for the poverty of the country " And the outbreak of the French Revolution terminated the plan to import French professors for the various subjects

Next, Charles Willson Peale, following a vain effort to establish an association for the advancement of art in Philadelphia in 1791, drew up plans four years later for the opening of the Columbianum, or American Academy of Painting, Sculpture, and Architecture, including a school for architecture, anatomy, sculpture, painting, chemistry of paints, and engraving, an art library, a hall of plaster casts, a gallery of old masters, and a gallery of contemporary painting It happened that, as early as 1784, the English painter Robert Edge Pine had arrived with one of the first casts to reach our shores, the Venus de' Medici (fig 8). To initiate the hall of casts, Peale borrowed Pine's cast of the Venus de' Medici, but the lady "was kept shut up in a case and only shown to persons who particularly wished to see it, as the manners of our country, at that time, would not tolerate a public exhibition of such a figure "[4] Moral scruples also affected the art school, and the Columbianum failed in its turn

George Washington's interest in classical art seems to have had a somewhat involuntary beginning. For in 1759 he sent to London for busts of Alexander the Great, Julius Caesar, the Duke of Marlborough, Charles XII of Sweden, and other military personalities, but his correspondent sent him statues of Bacchus and Flora instead. Later, Washington had a collection of gems.

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[3] For information pertaining to the Tammany Museum and its successors I am greatly indebted to Edwin P Kilroe, who, after depositing a large portion of his Tammany Collection with Columbia University, kindly sent me his unpublished manuscript on "The American or Tammany Museum " See also, *passim*, George C. D Odell, *Annals of the New York Stage* (New York, 1927 ff), and I N Phelps Stokes, *The Iconography of Manhattan Island* (New York, 1915–1928)

[4] Joseph Hopkinson, in a letter of May 6, 1833.

In the many-sided Benjamin Franklin I have as yet found no archaeological phase, beyond the fact that "Specimens of the Papyrus of Syracuse were presented by Franklin" to the Philosophical Society in 1789.[7]

Thomas Jefferson's interest in classical civilization, on the other hand, was outstanding, his love of ancient literature and history, as the source of our modern civilization, was such that toward the end of his life he hardly passed a day without reading a portion of the classics. But his was more than a purely literary interest: his letters are frequently concerned with philological matters, pertaining not only to the classical languages, but also to their modern derivatives. From Paris, where he served from 1784 to 1789, Jefferson wrote in 1785 to John Page: "The modern Greek is not yet so far departed from its ancient model, but that we might still hope to see the language of Homer and Demosthenes flow with purity from the lips of an ingenuous people." He was interested, too, in modern Greece for its own sake, and as early as 1787 he wrote to George Wythe these prophetic words from Paris: "This world is going all to war . . . It cannot fail to spread itself all over Europe . . . I cannot help looking forward to the re-establishment of the Greeks as a people." As for archaeology, "A work on Grecian Antiquities, by the Abbe Barthelemi, of great classical learning, the produce of twenty years' labor, is now in the press, about eight volumes 8vo." It was likewise from Paris that Jefferson wrote in 1785 that he would recommend Rome as a center for the study of Latin pronunciation, of the fine arts, and of archaeology. The teaching of the fine arts had preoccupied him as early as 1779, when in his bill to amend the constitution of William and Mary College he had proposed the inclusion of professors who should instruct in the fine arts as well as in ancient languages.

Classical Lands

Thomas Jefferson never reached Greece but at least he saw southern France and northern Italy. "In the latter country, my time allowed me to go no farther than Turin, Milan, and Genoa, consequently, I scarcely got into classical ground. . . . In architecture, painting, sculpture, I found much amusement, but more than all, in their agriculture." The splendidly preserved Roman temple at Nîmes, the Maison Carrée, however, made such an impression upon him that he embodied it in his own design for the State House at Richmond, thus initiating the classical revival movement in architecture in the United States. But Jefferson did not limit his interest to the Roman revival, the Greek, too, drew his attention, and, as he later wrote to Robert Mills, "On a particular occasion, I recommended for [the monument of] General Washington that, commonly called the lantern of Demosthenes, of which you once sent me a drawing handsomely done by yourself."

It was under Jefferson's influence that another architect, Charles Bulfinch, of Boston, between 1785 and 1787, followed his footsteps to the Maison Carrée at Nîmes, and thence pursued his travels to Italy, including Florence and Rome. The effects of his classical contacts were apparent in his Beacon Monument at Boston, the Massachusetts State House, and, in the following century, the prosecution of the work on the United States Capitol at Washington.

Italy, and particularly Rome, now began to attract painters from our country, primarily for the sake of contact with the colorful masterpieces of the Renaissance, the remains of antiquity being purely secondary. The earliest, as we have noted, was John Smibert in his pre-American days. Next, an otherwise unknown painter named Steele, from Maryland, is reported to have been in Italy long before Charles Willson Peale encountered him in 1762. Vastly more important was Benjamin West,[8] who started off in a grain ship consigned to Messrs. Rutherford and Jackson at Leghorn in 1760. As soon as West reached Rome, on July 10 of that year, the rumor "that he was an American and a Quaker, come to study the fine arts," so aroused the curiosity of Thomas Robinson (afterwards Baron Grantham) that on this very evening West was invited to dine with the leading antiquarians and artists of Rome, including the arbiter of the arts, the patron of Winckelmann, the aged and blind Cardinal Alessandro Albani West was introduced as "a young American, who has a letter of introduction to Your Eminence, and who has come to Italy for the purpose of studying the fine arts" The single word "American" drew the Cardinal's attention "Is he black or white?" "Very fair," came the reply "What, as fair as I am?" asked the swarthy Cardinal And so, as a delightful novelty, West was borne off the following morning by the Cardinal and the entire assembly in a procession of thirty carriages that they might observe his reactions to the ancient art of the Vatican Museum It was a difficult moment for the young man when they suddenly came upon the prize of the Museum, the statue that Winckelmann had just pronounced "among all the works of antiquity which have escaped destruction the highest ideal of Art,"[9] the Apollo Belvedere (fig 7), in the chill classic nudity that West had never yet beheld "My God, how like it is to a young Mohawk warrior!" West extricated himself from this involuntary aspersion only by extolling the "noble savage"

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[7] *Early Proceedings*: 176 (Oct. 2, 1789).

[8] For West, see James T. Flexner, *America's Old Masters* (New York, 1939): 17-97, 318-320, with very complete bibliography. Some of the passages are quoted from John Galt, *The Life, Studies, and Works of Benjamin West* (London, 1820).

Winckelmann was just at this moment completing his *History of Ancient Art*, which was to be the foundation of classical archaeology for many years to come, Piranesi was at the height of his career, Paestum and its Greek temples had just become known, Herculaneum and Pompeii were in process of excavation, and here at Rome was still the painter-antiquarian-dealer Gavin Hamilton, whose former colleagues Stuart and Revett had completed their voyage to Greece and had returned to England In the Rome of this period

> all strangers simultaneously turned their attention to the transactions and affairs of former ages, and of statesmen and authors now no more Their mornings were spent in surveying the monuments raised to public virtue, and in giving local features in their minds to the knowledge which they had acquired by the perusal of those works that have perpetuated the dignity of the Roman character Their evenings were often allotted to the comparison of their respective conjectures and to ascertain the authenticity and history of the relics which they had collected of antient art

West took the opportunity of "improving his knowledge of the antient costume by the study of Cameos" He found particular pleasure in "the celebrated statues ascribed to Phidias, on the Monte Cavallo" All these classical influences were intensified as West attached himself as a pupil to Anton Raphael Mengs, the associate of Winckelmann Within three years the phenomenal success of "the American Raphael" resulted in his election to the Academies of Florence, Bologna, and Parma before he attained the age of twenty-five His interpretation of the classical teachings of Winckelmann was responsible for his immediate popularity in England, and even for his election to the presidency of the Royal Academy as successor to Sir Joshua Reynolds, though as early as 1771 he had begun to show a less classical tendency in the "Death of Wolfe"

West had one more opportunity of seeing his classical models from Italy after the Peace of Amiens in 1802, he and various English artists crossed to Paris to see the spoils of Europe that Bonaparte had united in the Musée Nationale Later, when the Elgin marbles arrived in London, West wrote to the Earl of Elgin in 1809 and 1811

> I have to thank you for the indulgence you afforded me, to study, and draw from, the sculptures by Phidias, in your Lordship's house in Piccadilly Esteeming this collection as I do, my Lord, I flatter myself it will not be unacceptable for your Lordship to know, what are the studies I have made from it From the large figure of Theseus [of the Parthenon], I have drawn a figure of that hero, of the same size with the sculpture *Before him, on* the ground, I have laid the dead body of the Minotaur whom he slew As, by this enterprise, he was extricated from the Labyrinth by the aid of Ariadne, I have represented that Princess sitting by his side, gazing on him with affection To your Lordship I have to return my sincere thanks, for the means you have afforded me of adding my name to that of Phidias Had I been blessed with seeing and studying these emanations of genius at an earlier period of life, the sentiment of their pre-eminence would have animated all my exertions, and the more character, and expression, and life, would have pervaded all my humble attempts in Historical Painting

And when, during the examination into the Earl of Elgin's pursuits in Greece before the House of Commons in 1816, the health of the aged president of the Royal Academy did not permit him to attend, he was sent a series of questions, for example[10]

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[9] Winckelmann, *History of Ancient Art* II: 3, 11

[10] *Memorandum on the Subject of the Earl of Elgin's Pursuits in Greece, Presented before the House of Commons* (2nd ed, London, 1815) 47–56 *Report from the Select Committee of the House of Commons on the Earl of Elgin's Collection of Sculptured Marbles* (London, 1816) 148–154

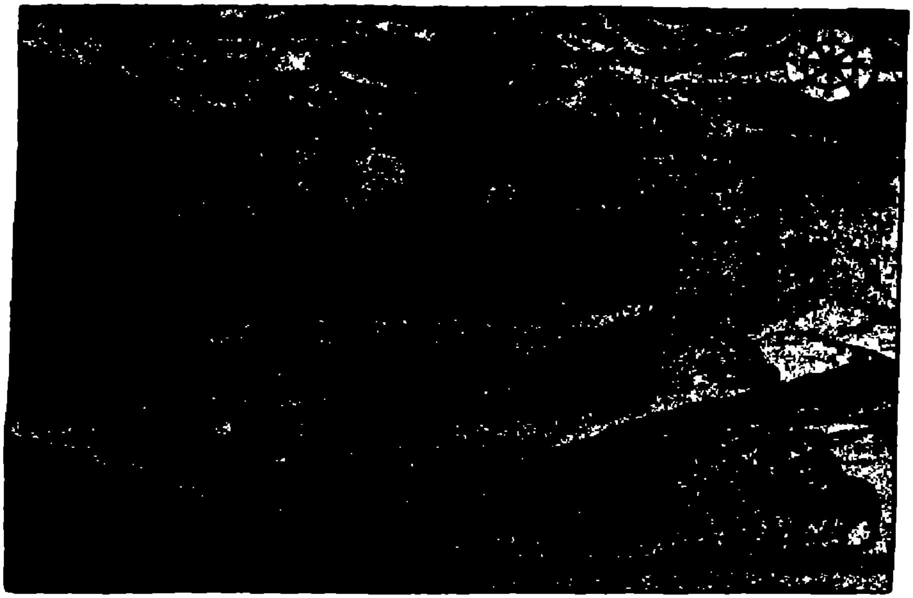

FIG 1. Sandys, a future American, sees the Pyramids (1611)

FIG. 2 The earliest cuneiform tablets brought to America (1817)

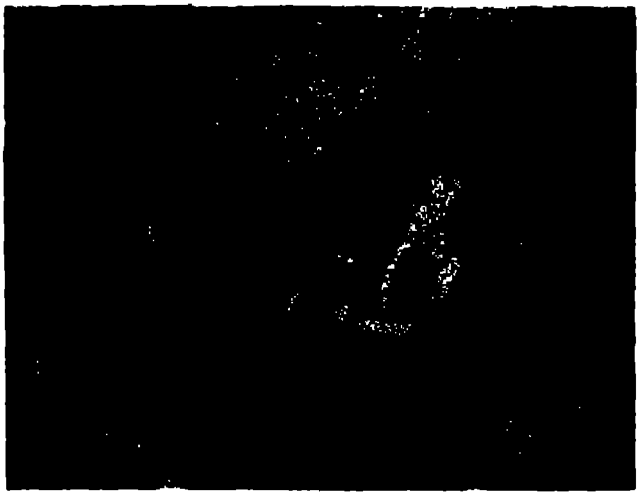

FIG 3 "Mr and Mrs. Ralph Izard," by Copley (Museum of Fine Arts, Boston)

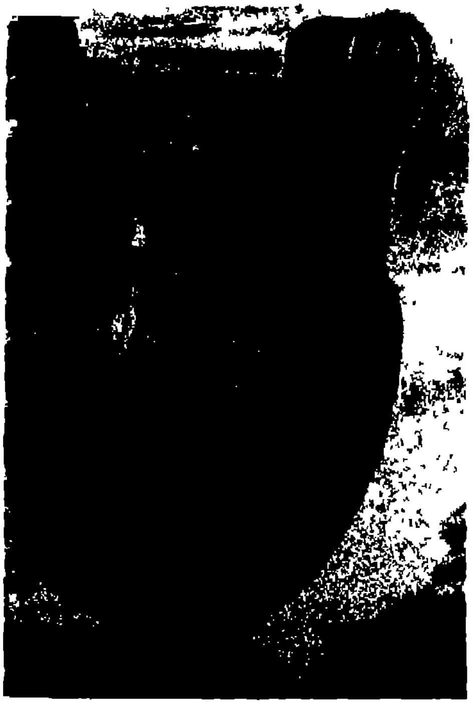

FIG 4 Detail of figure 3, lost volute-crater by the "Niobid Painter"

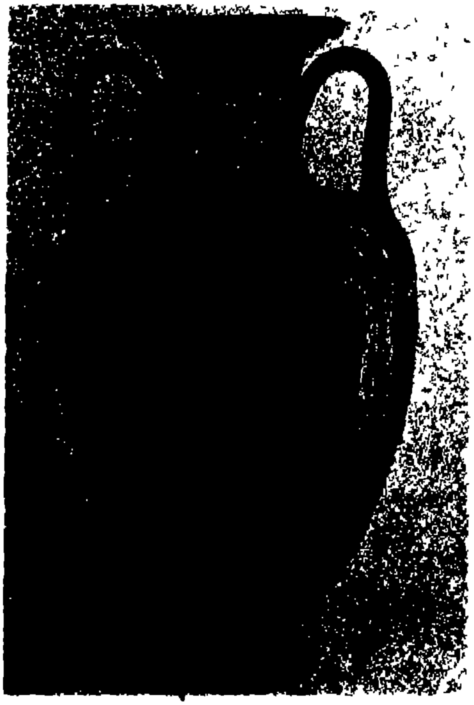

FIG 5 Amphora by the "Niobid Painter" (Wagner Museum, Würzburg)

> As compared with the Apollo Belvedere, the Torso of the Belvedere, and the Laocoon, how do you estimate the Theseus or Hercules and the River God or Ilissus?
>
> Answer
>
> The Apollo of the Belvedere, the Torso, and the Laocoon, are systematic art, the Theseus and the Ilissus stand supreme in art I think them of the highest importance in art that ever presented itself in this Country, not only for instruction in professional studies, but also to inform the public mind in what is dignified in art

West's evidence was one of the most decisive factors in persuading the Parliament to acquire the Elgin Marbles for the British Museum His judgment of the Mohawk was not so bad!

The next of the American painters in Italy was apparently "Old Mr Smith" of Long Island, who was living near Florence as late as 1831 reputedly in his hundred and sixteenth year Soon, too, following West's example, came his fellow-Philadelphian Henry Benbridge, who arrived in 1764 or 1765 and studied with Raphael Mengs and Pompeo Battoni, Benbridge was sent by James Boswell to Corsica to paint the portrait of General Paoli in 1768, and by January of 1771 he had come back to Philadelphia Next, following West's advice, John Singleton Copley,[11] of Boston, went to Rome by way of London in the autumn of 1774 In Florence,

> At the grand duke's gallery there is a wonderful collection of pictures, statues, bas-reliefs, and gems I saw the statue of the Venus de' Medici (fig 8), which was discovered near Rome it has been made nearly two thousand years, yet it is as perfect in all its parts, as clean and fair in its color, as if it had been finished but a day, and so beautiful that one stands astonished to see how marble could be endued with so much appearance of life

At Rome, he says,

> I have seen the Capitol, some of the ruins, especially the Coliseum, together with many of the finest works in sculpture The Apollo [fig 7], Laocoon [fig 6], etc leave nothing for the human mind to wish for, *more* cannot be effected by the power of genius than is happily combined in these miracles of the chisel After all the praise lavished on them by the various writers that have come within my knowledge I had formed a very imperfect idea of their excellence

Of the Laocoon in particular he says,

> This is not only the best work of art in the world *now*, but it was esteemed by the ancients the first in point of merit that the chisel ever produced Although I had seen fine casts [presumably in London or Paris] and read Pliny's description, when I saw the original I was astonished, not that the copies are defective in form for the models have been made on the original, but there is in marble that fine transparence that gives it both the softness and the animation of real life The Apollo is another wonderful production

Toward the end of January, 1775, apparently in company with Gulian Verplanck, of New York, he left Rome for Naples, and from that base made intensive visits to Pompeii and Herculaneum, and, having met at Naples Ralph Izard, of South Carolina, and his wife, from Mamaroneck, New York,

> I accepted Mr Izard's invitation to accompany him to Paestum, sixty miles beyond Naples, where there are some wonderful ruins, so old that no authentic accounts exist concerning them There is to be seen of this City the Walls and the Vestiges of three or four Temples, and an Amphitheater, this is all that remains to be seen at this Day, the Ground for Ages has been plowed and so little has the place been known that it is not menshoned by any Author, tho a place of as much curiosity as any I have seen, it being older than Rome and it[s] Architecture that of the first Dawning of that Science among the Greeks

Thus Copley is probably to be regarded as the first American to have seen a Greek temple

Returning to Rome, he undertook a double-portrait, the only one of his paintings executed in Italy, representing Mrs Izard in the act of presenting to her husband a sketch that she has made of the group of "Papirius Praetextatus and his Mother" (the Electra and Orestes) shown in the background (now in the Museo Nazionale at Rome), while in the distance is the Coliseum, and in the upper left corner is a Greek vase, an Athenian red-figured volute-crater (fig 3) Special interest attaches to the fact that this vase (fig 4), though now lost, was so accurately delineated by Copley that modern archaeologists have been able to identify it just as satisfactorily as if it still existed, as a work by, or at least in the manner of, the so-called "Niobid Painter" of about 450 B C [12] An almost identical scene occurs on an amphora acquired in 1921 by the Wagner Museum of the University of Würzburg (fig 5),[13] it is clear that the two vases must have been executed by the same painter, the "Niobid Painter," but it is equally clear that the two vases are distinct, since Copley could never have adapted the scene on the Würzburg amphora to the crater of the Izard portrait, and he would hardly have been able to supply, without committing some anachronism, a decorative border on the rim so characteristic of the middle of the fifth century The Izard vase was probably in Rome at the time, and has never been seen since, even its image disappeared from view, the portrait having been rolled up in Rome and brought to the painter's house in London, where it remained (most of the time rolled up) for fifty years,[14] until a grandson of the subjects, Charles Manigault, rescued the painting from a London garret in 1825 and carried it to South Carolina, whence it finally journeyed to the Boston Museum of Fine Arts

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[11] For Copley, see Flexner, *op cit* 99-167, 321-323, with bibliography Quotations from his letters are from Martha B Amory, *The Domestic and Artistic Life of John Singleton Copley, R A* (Boston, 1882), Massachusetts Historical Society, *The Letters and Papers of John Singleton Copley and Henry Pelham, 1739–1776* (*Collections* 71, 1914)

Another effort of Copley's was more abortive. writing from Rome,

> I shall find means to carry with me the most valuable specimens of art, in casts of plaster of Paris, of the finest works in the world By having some of the best in my apartment, I shall always have the advantage of drawing from them, which will be much superior to spending one or two years in Rome

But the case containing the casts was improperly packed, on arrival in London they were found to be broken into a thousand pieces, which "he never ceased to regret during the whole course of his after-life "

Returning travelers often brought home souvenirs of classical antiquity, especially those that were small in scale such as gems or coins In 1752 the Library Company of Philadelphia received "A noble present of antient medals, from Mr Gray, Member of Parliament for Colchester "[15] Again, in 1768, "Mr Thos Brown presented a Box of Medals to the [American Philosophical] Society."[16] The Museum and Waxwork in New York contained, according to the catalogue of 1793, under the heading "Artificial Curiosities," "A Collection of Coins and Medals " A broadside of the Tammany Museum, with which this was united, states that in 1796 "a very large collection of Coins and Medals was added to the Museum, amongst which are a Copper Coin in Claudius Caesar's reign, which was in the year 43 after the coming of Christ—and a number of other ancient and modern Coins and Medals " But only sixty days after this boastful announcement, which apparently excited the cupidity of vandals, Gardiner Baker, the curator, desperately advertised a

> Robbery On Tuesday morning, between ten and twelve o'clock, a square of glass was broken by some person or persons (who must be the most infamous characters in Society) and the Museum robbed of between twenty and thirty very valuable large Silver Antique Coins and Medals, amongst which are the following [citing three of Cromwell, Charles II, and Louis XV]. The others I cannot recall amongst so large a collection, but they were all considered great

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[12] The attribution to the group of the "Niobid Painter" was made by Lacey D Caskey during correspondence with John D Beazley in 1932, and Beazley replied on December 17, 1932, "the vase must be either by the Niobid Painter or the very next thing " In Beazley's *Attic Red-Figure Vase-Painters* (Oxford, 1942 424) it appears as No 1 of the list in the manner of the Niobid Painter I am indebted to Miss Grace W Nelson, of the Boston Museum, for information as to this correspondence

[13] Ernst Langlotz, *Martin von Wagner-Museum der Universität Würzburg Griechische Vasen* (Munich, 1932) 99-100, no 503, pl 170

[14] As to the whereabouts of the Izard vase, neither Beazley nor any other authority, nor the descendants of Izard at Charleston, S C, have any knowledge Beazley says "Once Izard," and in his index assigns it to "*Sir* Ralph Izard", but this conjecture seems improbable unless it were one that Izard had purchased in Naples or Rome and never succeeded in transporting to England or America It might, to be sure, be argued that it had been in London if we could accept J H Morgan's suggestion that the table shown in the Izard painting was owned by Copley in London, since it appears also in the portrait of Henry Addington, afterwards Viscount Sidmouth, painted at London in 1797 and now in the City Art Museum of St Louis. This, if verified, would imply that the Izard painting was not finished, so far as accessories were concerned, until after the return to London (with possible implications as to the location of the vase) But this seems improbable, and another interpretation may be based on the fact that the table of 1797, while identical with that of 1775, is reversed, both as to the perspective and also the direction in which the guilloche pattern runs, as if the table had been traced from the Izard painting and transferred to the other In any case we must conclude that the Izard portrait, instead of being rolled up and unseen for fifty years, was unrolled by Copley himself at least once after reaching London, either to finish it or to copy from it, and it is most reasonable to assume that both the table and the vase were at Rome, like the Electra and the Coliseum

[15] George M Abbot, *A Short History of the Library Company of Philadelphia* (Philadelphia, 1913)· 9

[16] *Early Proceedings* 20 (Nov. 15, 1768)

curiosities. The arrangement of the coins is temporary, and, although in its infancy, consists of several hundreds of different kinds This is the second time the Museum has been robbed of Coins and Medals.

Egypt

One of the first Americans to encounter Egyptian antiquities was Benjamin West at Rome in 1760·

> Of all the monuments of ancient art in Rome, the Obelisk brought from Egypt in the reign of Augustus, interested his curiosity the most—the hieroglyphs appeared to resemble so exactly the figures in the Wampum belts of the Indians, that it occurred to him, if ever the mysteries of Egypt were to be interpreted, it might be by the aborigines of America [17]

On December 14, 1767, Francis Hopkinson returned from London, bringing for the Library Company of Philadelphia

> a Woman's Hand taken from an Egyptian Mummy in good Preservation presented with his respectful Compl[ts] to the Company by Mr Benjamin West, formerly of this City, but now of London Historical Painter [18]

When John Ledyard, of Groton, Connecticut, professional traveler, after sailing with Captain Cook on his last voyage and after exploring Siberia, was sent out in 1788 by the "African Association" of London to traverse the interior of Africa, he reached Alexandria on August 4 and fifteen days later was at Cairo, whence he sent three letters to Thomas Jefferson at Paris "I have seen a small mummy, it has what I call wampum-work on it Even your curiosity and love of antiquity would not detain you in Egypt three months" But by the end of November, just as he was about to ascend the Nile, Ledyard died in Cairo, the first American casualty in the story of Egyptian exploration [19]

Only one American publication dealing with the antiquities of Egypt can be cited for our period, namely, a compilation from the works of Norden, Savary, Niebuhr, Bruce, Volney, Pococke, and Payne's *Universal Geography*, inspired by the notoriety of Napoleon Bonaparte's invasion of Egypt, and published for John Remmey at New York in the very last year of the century [20]

Western Asia

When Copley reached Italy in 1775 he wrote, "Mr Boylston has been within a few weeks past at Leghorn after his return from Turkey "[21] This was apparently one of the few direct contacts of Americans with Western Asia before the Revolution Even for many years thereafter no official relations were opened with the Ottoman Empire For, though John Adams, Benjamin Franklin, and John Jay, when serving as treaty commissioners in 1779, were expected to include negotiations with Turkey, nothing was done either then or in 1786 when the project was reopened And as late as 1799, when William Smith, of Charleston, South Carolina, then Minister to Portugal, was nominated as Envoy Extraordinary to Constantinople, the appointment was never confirmed Nevertheless, American trading ships were permitted to operate under the protection of the English Levant Company, for certain financial considerations, and Smyrna figs were soon well known in the United States, while in 1785 a Boston firm advertised "a few casks of best Smyrna raisins for sale "[22]

NINETEENTH CENTURY AMUSEMENTS AND EDUCATIONAL INSTITUTIONS

One of the phenomena of the period after 1800 was the rapid growth of the museums In 1800 the Rev Joseph Stewart set up a museum of curiosities at Hartford, which was kept in the attic of the statehouse In New York, in the same year, busts and figures imported from Europe were advertised to be shown at Corre's Mount Vernon Garden In New York, also, Savage had established the Columbian Gallery in the Pantheon in 1802, just before the Academy of Fine Arts occupied it, and then transferred his exhibit to the New York Museum at 166 Greenwich Street, where John Scudder received his training

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[17] Galt, *Benjamin West* 1 132

[18] Austin K. Gray, *Benjamin Franklin's Library* (New York, 1937) 24, *cf* Abbot, *History of the Library Company*, 10.

[19] Jared Sparks, *The Life of John Ledyard, the American Traveller* (Cambridge, 1828, reprinted in his collection, *The Library of American Biography*, 2d series, 18, Boston, 1855).

[20] Remmey, *An Account of the Present State of Egypt*, etc (New York, 1799)

[21] Massachusetts Historical Society, *Letters of Copley and Pelham* This was Ward Nicholas Boylston (1749–1828), grand-nephew of Dr Zabdiel Boylston, who was the first to inoculate for smallpox in America in 1721

[22] C O Paullin, *Diplomatic Negotiations of American Naval Officers 1778–1883* (Baltimore, 1912) 127–129, Walter L. Wright, Jr, *American Relations with Turkey to 1831* (unpublished dissertation at Princeton University), Leland J Gordon, *American Relations with Turkey 1830–1930* (Philadelphia, 1932) 8, 41,

At Philadelphia, Peale's Museum continued to be exhibited in Independence Hall and, in part, in the hall of the American Philosophical Society, though Charles W Peale himself retired from active participation in 1810 and withdrew to Germantown, leaving his naturalist son Rubens in charge Ten years later, Rubens Peale having decided to go to Baltimore, Peale's Museum at Philadelphia was incorporated with Benjamin Franklin Peale as manager and Titian Ramsay Peale as curator Under the new management it gradually became less scientific and more sensational, but it was still in Independence Hall when Charles W. Peale painted "The Artist in His Museum" in 1824, and even long after his death in 1827 In 1838 it was removed to the Arcade, and in 1848 to the Chinese Museum at Philadelphia, where Phineas T Barnum bought part of its contents The last remains of the museum were dispersed by auction in 1854.

Rembrandt Peale also followed in his father's footsteps. After having taken one of the two mammoth skeletons to London in 1802–03, and after having made a visit to Paris in 1807–09—where, on account of his museum experience, he was offered employment by Vivant Denon under the French Government, but declined—he migrated to Baltimore in 1814 and established Peale's Museum and Gallery of Paintings in that city, along the lines of its Philadelphia predecessor, with paintings and curiosities and even the second mammoth which had traveled to London and back Rembrandt remained in charge for six years, and thereupon was relieved by Rubens Peale

From Baltimore in turn Rubens Peale migrated to New York and here established another Peale's Museum and Gallery of the Fine Arts in 1825, in a building appropriately named the Parthenon (252 Broadway at the corner of Murray Street), opposite the City Hall Scientific lectures began here in 1826 In 1838 a company procured a state charter as the "New York Museum Company" and purchased Peale's Museum as the beginning of a greater operation, which came to naught In 1840, however, the name was changed to the New York Museum of Natural History and Science, and in 1842 to Hill's New York Museum, the name of the proprietor being dropped when he failed later in the year. After another failure the museum was bought on January 2, 1843, by Phineas T. Barnum, who reopened it as Peale's New York Museum and ran it for several months as an ostensible rival to himself.

In 1809, meanwhile, the old Tammany Museum in New York was purchased by John Scudder, who transferred it to 21 Chatham Street and reopened it the following year as the New American Museum Scudder hoped to build up his American Museum along the lines of the British Museum In 1816, moreover, when the old almshouse on the north side of City Hall Park (facing Chambers Street, on the site of the present County Court House) was abandoned in favor of "a palace at Bellevue," the building was turned over to educational purposes and renamed the "New York Institution"; there, along with the New York Historical Society and the American Academy of the Fine Arts, Scudder acquired a ten-year lease for his museum, the actual transfer took place in 1817, with a great sign "American Museum" which forms a striking feature in the well-known view of "New York City Hall Park, North end, 1825" After Scudder's death in 1821 the American Museum remained in the "New York Institution" for nine more years, and then was exiled in 1830 to the corner of Broadway and Ann Street, opposite St. Paul's Church, where it reopened on December 24 in the "New Marble Buildings" erected for the purpose, as shown in a "view of St. Paul's Church and the Broadway Stages, N. Y 1831" In 1840, the American Museum was advertised for sale, and the "New York Museum Company," which had already purchased Peale's Museum, planned to obtain the entire block bounded by Broadway, Ann, Fulton, and Nassau Streets, and so opened negotiations with Scudder's heirs. But they were anticipated by Phineas T Barnum, who first assumed a position as manager in 1841, and on December 27, 1841, bought the Museum outright for $12,000

The sequel is to be traced under the title of "Barnum's American Museum" The site and name of the museum (at 218–220 Broadway) remained unchanged, apart from minor alterations and additions, and such embellishments of the name as "American Museum and Garden and Gallery of Fine Arts" In 1843 Barnum added the contents of Peale's Museum; and in 1851 the contents of the Chinese Museum (539 Broadway) followed the same course. To accommodate this additional material, Barnum acquired the adjoining building of the Chemical Bank and reopened in 1850, with considerable alterations and improvements. This building, after a preliminary fire in 1864, was destroyed with all its contents in a great conflagration on July 13, 1865. Barnum reopened seven weeks later at the old Chinese Museum (539 Broadway), but this too was destroyed by fire in 1868. The same fate overtook the Hippotheatron on 14th Street, which he opened in 1872, and lost by fire the same year.

At Washington there had been a collection of models, called "The American Museum of Art," in the Patent Office erected in 1812 and destroyed by fire in 1836. The next step was the establishment of John Varden's Museum. Varden says that he began it in 1829, "in consequence of three persons having opened and made very great collections from the generous citizens (of Washington) and then leaving the place, taking the many rich and scarce donations with them, thus leaving the seat of Government without so valuable an institution." He kept a MS catalogue with lists and dates of acquisitions and with names of donors or lenders. By 1836 he had 400 or 500 specimens, curiosities, relics, and objects, at the corner of John Marshall Place and D Street, near the City Hall. In this year he changed the name to the Washington Museum, probably as a consequence of the destruction of its rival. But in 1841 it was absorbed by the National Institute.

Even the earliest of the now existing great museums originated as a private organization, the National Institute for the Promotion of Science founded at Washington in 1840, absorbing Varden's Museum in 1841, and incorporated by act of Congress for twenty years in 1842. In it were deposited the collections accumulated by the Government until 1850, all being stored on the top floor of the new Patent Office, along with the material accumulated since 1838 for the Smithsonian Institution. A report of January 1, 1842, mentions "about 500 castings in plaster, medals and seals," and "ten pieces of statuary in marble, or plaster," while a report of November 22 of the same year includes "Egyptian antiquities and hieroglyphs." The organization of the Smithsonian Institution in 1846 provided for sections on ethnology and archaeology and on fine arts, the latter being the material in the custody of the National Institute which in 1847 unofficially assumed the name "National Museum," twenty-eight years before the term was actually employed by Congress. The completion of the Smithsonian building in 1857 made it possible to remove most of the collection from the Patent Office the next year, but the National Institute retained its jurisdiction over the fine arts material until the expiration of the twenty years of incorporation in 1862, whereupon this material, likewise, was removed from the Patent Office to the Smithsonian. Then, on January 24, 1865, occurred another of the usual catastrophes of the period: a great fire in the upper part of the Smithsonian building destroyed the larger part of the art collections, as well as the unpublished records and inventories. What little survived the fire was distributed between the Library of Congress and, eventually, the Corcoran Art Gallery, where it remained until it was recalled in 1896 to its proper place in the special building which had been erected for the purposes of the United States National Museum in 1881.

Another source of amusement and instruction was the panorama, which brought Mediterranean lands closer to the untraveled man. Invented by Robert Barker at Edinburgh in 1787, and already introduced by Gardiner Baker in 1797 ("New Phenomenon in Greenwich Street"), it entered the archaeological sphere with the "City of Rome" in 1810 at the New York Museum (166 Greenwich St.). Scudder's "Optical Cosmorama" was exhibiting Egypt, Sicily, and Italy as early as 1815, and at Vanderlyn's new Rotunda in 1817 appeared "Athens as it now is," painted by the inventor Barker of London, before a similar panorama of Athens, given to Harvard College, Edward Everett delivered his lectures on Greek antiquities. Other panoramic painters of the time were John and Robert Burford of London (generally utilizing sketches by the architect F. Catherwood), and later Samuel Bell Waugh and John Banvard. Italian scenes, including Rome, Pompeii, Herculaneum, and Paestum, were of course the most numerous; but Jerusalem and the Holy Land, Petra, Egypt, and Nubia (including Burford's Thebes and Karnak, and Gliddon's transparent panorama of the Nile), followed one another with undiminished popularity up to the time of the Civil War.

Nineteenth Century: Classical Archaeology

The first actual students of classical archaeology—and in consequence obliged to study abroad—were George Ticknor and Edward Everett of Boston, graduates of Dartmouth (1807) and Harvard (1811), respectively. Everett, after a short but brilliant career as minister of the Brattle St Church, where he had succeeded Dr Buckminster, was now designated as Eliot Professor of Greek Literature in Harvard College, with a leave of absence for two years (afterwards extended to four) in order to perfect himself in his new profession Ticknor, meanwhile, had journeyed southward to consult Thomas Jefferson Ticknor and Everett sailed together on April 16, 1815, as yet unaware of Napoleon's escape from Elba With Greece in mind, they visited Lord Byron in London to obtain letters of introduction to Athens and to Ali Pasha of Janina, and were with him at the moment when the courier arrived with the news of Waterloo "My Lord, a great battle has been fought and Bonaparte is entirely defeated" Byron incredulously replied "But is it true? I am damned sorry for it" After Waterloo, however, the continent lay open for peaceful study, and, provided also with letters to Canova from Sir Humphrey Davy, they set forth to study at Göttingen under the spell of the Greek classics Citing Professor Gottlob Schulze, Ticknor wrote to his father "We (in the United States) do not yet know what a Greek scholar is, we do not even know the process by which a man is to be made one" He "had a course of archaeology five times a week by Prof Welcker" "Winckelmann, who has long been the first authority in France and Italy on all subjects relating to the arts of the ancients and Heyne and his school in ancient criticism have placed your country [Germany] at the head of classical learning in Europe" And Everett adds, "I am looking into Winckelmann's works and find them charming, more however from the subject than from the manner in which he treats it, which is arrogant, and the German arrogance is not so hearty as the English nor so courtly as the French It has the airs of an upstart gentleman"

Visitors to Italy

Beginning with the nineteenth century, casual travelers more frequently explored the antiquities of Italy One of the first was "A Native of Pennsylvania" [Joseph Sansom] who published two volumes on his travels during 1801–1802 in Switzerland and Italy, with some notice of the antiquities of Florence, Rome, and Naples, his rash claim that "he is the first American, who ever wrote his travels" elicited from a Boston reviewer the caustic response, "No book was ever less wanted, than the Philadelphian's, and none ever deserved type and paper less" At the same time, in 1802, William Tudor of Boston was writing his detailed letters from Naples, again including notices of the antiquities, such as the Farnese Bull in the public park along the bay. Another Bostonian, John Lowell the elder, was in Italy during the winter of 1804–1805, and published a series of letters from Florence, Rome, and Naples, with extensive notes on the antiquities of all three cities, including a visit to Pompeii and an account of the unrolling of the Herculaneum papyri Among other early visitors were W Dutton, Nicholas Biddle, Washington Irving, William T Andrews, William Sawyer, and William Hickling Prescott

In 1817 George Ticknor, having left Göttingen for Paris, visited Rome, where he met the antiquarian diplomats Bunsen and Niebuhr, the antiquity-collecting Crown Prince Ludwig of Bavaria, the Hellenizing sculptors Canova and Thorwaldsen, and the Bonaparte family, Lucien and Louis, their sister Pauline Borghese, and their mother Madame Laetitia, of whom he most liked Lucien At Naples he knew Sir William Gell, the student of Greek and Roman antiquities and topography Returning by way of France to Spain, he wrote at Nîmes in 1818 "I cannot, however, look at the Maison Carrée without being filled with indignation, that the Virginians, professing to take this graceful, light Greek Temple for their model, should yet have made such a clumsy, disproportioned, absurd thing as their Capitol at Richmond" By June of 1819 he was back in this country, ready to assume his duties in the Smith Professorship of the French and Spanish Languages and Literature at Harvard, which he had accepted in 1817[illegible] Meanwhile Joseph Green Cogswell, taking with him a young Harvard graduate named Augustus Thorndike, had followed Ticknor and Everett to Göttingen, and in 1817, with Edward Brooks, they overtook Ticknor at Rome Edward Everett, who had delayed at Paris for studies of Italian and modern Greek, and thence had visited England, did not reach Italy until after Ticknor's departure in 1818 George Bancroft, likewise after leaving Göttingen, was in Italy during 1821–22, meeting Princess Pauline Borghese

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[illegible] Long afterwards, having resigned his professorship, Ticknor made a second visit to Europe in 1835–38, including a stay at Rome, filling his notebooks with accounts of the art collections.

at Rome and Lord Byron with Countess Guiccioli at Naples.

Among the painters in the first quarter of the century the first to arrive was Washington Allston in 1804, followed the next year by John Vanderlyn, who had already studied at Paris for five years (1796–1801) and in 1803 was sent over again by the new Academy of Fine Arts to acquire casts and copies of paintings. At Rome Allston and Vanderlyn lived together until 1808, in company with Washington Irving and Samuel Taylor Coleridge, with Thorwaldsen as the arbiter of their taste, Washington Irving even considered abandoning literature to share the artistic career of his namesake. Gilbert Stuart Newton made a brief visit to Italy in 1817 but settled in London. William Edward West left the United States in 1822 and spent two years in Italy, painting Lord Byron at Leghorn in 1823. Robert Walker Weir reached Leghorn in 1825, lived in Rome for two years and then went to Naples. "Here I was joined by an English architect, with whom I made an extensive excursion to Paestum, where we measured the temples, and made such notes as we thought would be of use."

After the second quarter of the century had begun, the number of visiting painters rapidly increased, some were figure and historical painters, following the West-Copley tradition, while others were landscape painters who came primarily for the inspiration of Mediterranean scenery and picturesque ruins. Of these it is unnecessary here to do more than to list their names. George Cooke, John Gadsby Chapman, Rembrandt Peale, Samuel Finley Breese Morse, John Cranch, Thomas Cole, Francis Alexander, Frederick Styles Agate, Daniel Huntington, Henry Peters Gray, Thomas Pritchard, Emanuel Gottlieb Leutze, Luther Terry, William Morris Hunt, Christopher Pearse Cranch, George Inness, George Loring Brown, and William Page. To these we may add the names of those who went out during the next decade, before the Civil War. Jonathan Eastman Johnson, Elihu Vedder, Edward Harrison May, Worthington Whittredge, Albert Bierstadt, Samuel Colman, Sanford Robinson Gifford, and Jervis McEntee.

It was not until the second quarter of the century that the sculptors began to follow the painters to Rome. The first to come, in 1825, was Horatio Greenough, who in his youth had copied Roman coins in the Boston Athenaeum and "a marble statue of Phocion, a copy of the antique, which my father caused to be placed with its pedestal as an ornament to a mound in the garden." At Rome he studied with Thorwaldsen, and his first commission, the "Chanting Cherubs," the first marble group ever made by an American sculptor, was given him by James Fenimore Cooper. Nearly ten years after Greenough came Thomas Crawford and Shobal Vail Clevenger. Hiram Powers embarked for Italy in 1837, and established his fame with the "Greek Slave" in 1843, shown at the London Exposition of 1851 and at the New York World's Fair of 1853. Later sculptor visitors were Henry Kirke Brown, Joseph Mozier, Joel Tanner Hart, William Wetmore Story, Chauncey Bradley Ives, Harriet Goodhue Hosmer, Thomas Ball, Edward S Bartholemew, William H Rinehart, and Randolph Rogers.

Likewise with regard to the literary and other figures who visited Italy after the first quarter of the century we cannot here attempt to give more than a list of the more prominent. George Washington Greene, Andrew Bigelow (one of the first to visit the antiquities in Sicily), Henry Wadsworth Longfellow, James Fenimore Cooper, Ralph Waldo Emerson, Oliver Wendell Holmes, William McCracken, John Lowell, Jr, John Lothrop Motley, William Henry Channing, Thomas William Parsons, Isaac Appleton Jewett, W C Trevelyan, Charles Sumner, Charles Rockwell, Thomas Lloyd Halsey, Francis Parkman (who also visited Sicily, and wrote that he preferred Vesuvius to all the ruined temples), Theodore Parker, Charles Callahan Perkins, William Ellery Channing, Jr, Margaret Fuller Ossoli, George Stillman Hilliard, Henry Winthrop Sargent, James Jackson Jarves, Charles Eliot Norton, Rufus Choate, George Cabot Ward, James Russell Lowell, FitzWilliam Sargent, William Cullen Bryant, Charles Beck, Charlotte Saunders Cushman, Nathaniel Hawthorne, Richard Henry Dana II, George P Marsh, William James Stillman, Henry Brooks Adams, and William Dean Howells.

Most of these expressed, either through literature or by means of the representational arts, or by their patronage of art and archaeology, something of the impression that the culture of ancient Rome had made upon them, thus strengthening the foundations of archaeological studies.

Visitors to Greece

In 1806, the young secretary of the American Legation at Paris, Nicholas Biddle of Philadelphia, turned his eyes toward Greece. Biddle was our first American tourist in that part of the world, and so well did he improve his opportunities that, on his return and transfer to the Legation at London, he loved to run up to Cambridge and dispute with the dons on the differences and similarities between ancient and modern Greek [24] This contact, too, left a visual impress upon America, for in 1819 he was appointed by President Monroe as one of the directors of the Bank of the United States, an institution which he served as president for seventeen years. Under his guidance the Bank of the United States, in Philadelphia, was erected by Strickland as a copy of the Parthenon at Athens, and because of his insistence, Girard College at Philadelphia, a reflection of the Corinthian monument of Lysicrates at Athens, and his own country seat "Andalusia" on the Delaware, also rose as impressive classical Greek monuments

Lord Byron wrote to his mother from Athens on January 14, 1811 "Here I see and have conversed with French, Italians, Germans, Danes, Greeks, Turks, *Americans*, etc , etc , etc " It is difficult to imagine who the Americans could have been, unless they were officers of trading vessels, but the omission of the single word "Americans" in an identical passage in a letter written six days later to Francis Hodgson suggests that they were as imaginary as the *et cetera*

Edward Everett, whose oration "On the Restoration of Greece" in 1813, at the time of taking his degree of Master of Arts at the age of nineteen, had determined his lifelong career, necessarily pressed on from Rome toward Greece Even before coming to Italy he had studied modern Greek at Paris, and had met Adamantios Korais. George Ticknor would have waited to go to Greece with Everett, but the acceptance of the professorship of romance languages had changed the direction of his career Furthermore, Ticknor's father had written from Boston, "To see Athens, my son, is not worth exposing your life, nor the time nor the money you must spend to see it " So Everett found a new traveling companion in Theodore Lyman, and with letters from Lord Byron to Ali Pasha of Janina opening the way, they explored Thessaly, Delphi, Thebes and Athens, Corinth, Sparta, and Troy.

Everett assumed his professorial duties in 1819 One of his students in that first year, Ralph Waldo Emerson, wrote that "There was an influence on the young people from the genius of Everett which was almost comparable to that of Pericles in Athens . The word that he spoke, and the manner in which he spoke it, became current and classical in New England." At Boston he gave a public course of lectures on Antiquities Said Emerson "I have been attending Professor Everett's lectures which he has begun to deliver in this city upon Antiquities

I have heard this evening and shall elsewhere record Professor Everett's lecture on the Eleusinian Mysteries, Dordona [sic !], and Saint Sophia's Temple presented in the inimitable style of our Cicero " But with the last words of his Phi Beta Kappa address of 1824, as he glanced toward a guest of honor in the audience, "Welcome, thrice welcome to our shores! . Welcome, welcome, Lafayette," a professorial career was ended Edward Everett had entered the political field, but his five years of classical teaching had left firm foundations for the future study of antiquity

Even before this, however, Everett had meditated a change, when the outbreak of the Greek War of Independence aroused his sympathies, and in the *North American Review*, of which he was then editor, he published in October, 1823, an article which persuaded Daniel Webster to champion the cause of Greece Everett applied to John Quincy Adams, Secretary of State, asking to be sent out to Greece as member of a commission to investigate the progress of the revolution Webster and Calhoun advocated that he be made a special commissioner representing the Government But "the President [Monroe] has taken, as it happened, pretty high ground as to this continent, and is afraid of the appearance of interfering in the concerns of the other continent also"; and a published letter of Secretary Adams "showed such a want of feeling toward the poor Greeks" that the denial of the application was not unexpected.

Owing to Everett and others, warm sympathy for the Greek cause was aroused in the United States. The spectacular end of Lord Byron, who in 1823 volunteered for service in Greece, with a retinue of twelve people, five horses, two cannon, and 50,000 Spanish dollars, and died the next year at Missolonghi, likewise had a marked effect. Among the relics of various money-raising efforts is an anonymous little book published at New York in 1824, under the auspices of "The Grecian Ladies," composed of brief essays on *The Grecian Wreath of Victory*, contributed by Professors Anthon and Moore, as well as President Charles King, of Columbia College; Professor Everett, of Harvard University; Professor Doane, of Washington College, Hartford, Governor DeWitt Clinton; and Anthony Bleecker, Dr Hosack, Col John Trumbull, George Bancroft, and others

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[24] William N Bates, "Nicholas Biddle's Journey to Greece in 1806," *Proc Numism and Antiq Soc Philadelphia* 28 167-183, 1917; this Greek journal, formerly in the possession of a grandson, Edward Biddle, described the journey from Naples to Zante and thence through Greece, and there is thought to have been another book with drawings of Greek buildings.

The outstanding philhellene of the period was Dr Samuel Gridley Howe, who, immediately after taking his medical degree at Harvard in 1824, set out for the scene of warfare in Greece There he spent six years, first in guerilla warfare and afterwards as surgeon-general of the Greek fleet; he published his *Historical Sketch of the Greek Revolution* in 1828 before the end had been reached Another of the great figures of the period was Col Jonathan P Miller, the "American Dare-devil," who fought for the Greeks at Missolonghi and published *The Condition of Greece in 1827 and 1828* Both Howe and Miller returned to the United States and went back to Greece with relief ships, and others went out with John D Russ, Harry A V Post, and Samuel Woodruff Throughout this period, too, American warships were in the Aegean; Commodore John Rodgers had with him a considerable fleet, and an incident connected with Captain Daniel Patterson of the *Constitution*, as related by the chaplain, George Jones, will be noted in a following section.

As the war drew toward a close, missionaries began to arrive with plans for reconstruction and education, Rufus Anderson in 1829, Jonas King the Arabic scholar, John Henry Hill, and Elias Riggs in 1830 Anderson traveled in the Peloponnesus to study the problem of establishing mission stations in Greece But, as contrasted with the non-Christian countries of Western Asia, Greece proved to be sterile territory for proselyting, and the missionary efforts had to be limited to schools, even these sometimes awakening suspicion. The Hill school for girls at Athens was extremely successful, and Hill's private library formed a reference library for visiting American scholars But the schools established by Robertson on Syra and by Benton on Crete were not of long duration; and Riggs went back to Smyrna in 1838. Jonas King continued to live in Athens, in spite of numerous difficulties, he served as United States consular agent and consul in 1851-58, but nevertheless was anathematized by the Holy Synod of Athens in 1863 and one of his books was publicly burned Though he and the Greek clergy were eventually reconciled, it is obvious that the life of a missionary in Greece was not conducive to scholarly research

Of the few travelers who passed through Greece shortly after the war, for the most part on cruising ships or intent on reaching other ports, only John Lowell, Jr , Walter Colton, and Charles Rockwell need be mentioned

Toward the middle of the century began the influx of American scholars which was only in its initial stage before the Civil War Thus in 1848 came James M Hoppin, professor of the history of art at Yale, and in 1851 Henry M Baird, afterwards professor at New York University In 1853 arrived Cornelius Conway Felton, professor of Greek at Harvard and afterwards president. Baird published a book on *Modern Greece* in 1856, and in the same year Felton published *Selections from Modern Greek Writers*, and *Greece Ancient and Modern* in 1867 In 1856 came William Watson Goodwin, William Francis Allen, and W S Tyler, young graduates of Harvard, of whom two subsequently became professors at Harvard and the third, president of Amherst In 1858 came Lewis R Packard, Timothy Dwight, and William Wheeler, young Yale graduates who subsequently became professors at New Haven And in 1860 appeared Professor James C Van Benschoten, of Wesleyan, the last before the war These formed the vanguard of the stream of scholarly visitors to Greece, whose numbers increased rapidly during the succeeding decades of the century

The first organization of American scholars in the field of classical archaeology was the classical section of the American Oriental Society, organized in 1848 for "the cultivation of classical learning, so far as auxiliary to oriental research " Then were proposed such subjects for discussion as "the present state of the excavation of ancient ruins in Asia Minor" and "the extent to which we may expect valuable discoveries of antiquities in Macedonia and the northern parts of Greece." C C Felton was one of the most active in this group; papers were presented by J G Günther, of Roxbury, "On the Origin of the Pelasgians" and by A. N Arnold, of Newton, on "Archaeological Researches on the Acropolis of Athens" (on the basis of a communication from Pittakis). Unpublished Greek and Latin inscriptions from Pisidia, Antioch, Beirut, and the Hauran were forwarded by correspondents and discussed at the various meetings between 1849 and 1862. Not until after the Civil War were steps taken toward the foundation of special organizations in the classical fields, the American Philological Association in 1868 and the Archaeological Institute of America in 1879, as related hereafter.

Casts of Classical Sculpture

The most practical method of bringing ancient sculpture to the American public, in default of originals, was by means of plaster casts. We have already noted a few instances of this sort, as Smibert's busts, Washington's Flora and Bacchus, Copley's broken collection, and Pine's Venus. The origin of the earliest collection illustrative of the whole scope of Greek and Roman sculpture, of the very beginning of the nineteenth century, was due to the initiative of a mayor of New York, Edward Livingston. His brother, Chancellor Robert R. Livingston, being at that time Minister to France, was entrusted with the mission "to procure casts in plaister of the most beautiful pieces of ancient sculpture now collected in the National Museum" (i.e., the Louvre). In the New York *Daily Advertiser* of June 30, 1802, appears a notice that

> a subscription is circulating in this city, for the purpose of importing from Paris, exact models in Statuary, of the Venus de Medicis, the Apollo Belvedere, the Hercules Farnese, and the Group of the Laocoon, which are intended as exemplars for American Artists. . . . Should this subscription be secured, . . . it is proposed to extend it to procure other copies of the great remains of Antiquity.

It was reported on October 27 that "this is designed as the foundation of a gallery and school of sculpture, which, being the first established in the United States, will, it is expected, be held honorable to our city. . . . One of the most celebrated groupes, the Laocoon, and two of the finest statues, the Apollo and the Dying Gladiator, are already cast, and their arrival may be looked for daily." On December 3, 1802, was formed the "New York Academy of Fine Arts" (later called the "American Academy of the Fine Arts"), with Mayor Livingston as president, for the purpose of housing them. A member of the Academy who saw the casts at the time of their arrival in June, 1803, particularly remarked "a beautiful Cast of a Dying Gladiator [fig. 9], which, for elegance of figure, masterly workmanship, and richness of hue[!], surpasses any, either in London or Paris." Somewhat exaggerated accounts of the time claimed that "by the diligence of Mr. Livingston, our Minister at Paris, the society has received upwards of one hundred and fifty rare casts." In the shipments were included the "Apollo, called the Pythian Apollo, and the Apollo Belvidere, Venus of the Capitol, Laocoon and his Sons, Castor and Pollux; Combatant, called the fighting Gladiator and the Grecian Warrior, Germanicus, Silenus and Bacchus; Hermaphrodite, Venus of the Bath, Torso of a Venus, Grecian Cupid, Ceres, the Young Apollo, or Apollo and Lizard, Busts of Jupiter, Juno, Mercury, Bacchus, Niobe and Children (six), Laughing Faun, Roma, Homer, Lucretia, Pythagorus, Euripides, Socrates, Plato, Demosthenes, Nero, and Seneca." An old circus building on Greenwich Street, formerly known as the New Circus or Rickett's Amphitheatre and now as the Pantheon, was refitted for their reception and was opened on August 12, 1803. "In the rotunda of the Pantheon, the young student may pass his hours in uninterrupted study, cultivating his taste by contemplating the most correct models of ancient sculpture." In gratitude for the Emperor's generosity, the Academy elected both Napoleon and Vivant Denon, previously chief of the scientific section of the *Expédition de l'Égypte* and now director-general of the museums of France, to honorary membership in 1804, and the Emperor responded not only by acceptance but also with a gift of more casts and books, including a complete set of Piranesi's twenty-seven volumes and of Denon's *Description de l'Égypte*. Egypt was represented also by casts given by the British consul general in Egypt, George Baldwin, including a sculpture of the early Roman period from Arsinoe. Meanwhile, in the spring of 1803, with the intention of broadening the scope of the collection, the painter John Vanderlyn, who had already spent five years studying abroad, was commissioned "to proceed, with all convenient speed, to the city of Paris, and from thence to Florence, Rome, and such other places in Italy as he shall judge proper, in order to procure casts from antique statues and other pieces of sculpture, copies of the best paintings." The Vanderlyn commission does not seem to have justified expectations, but a few casts and copies of paintings duly arrived and were added to the exhibition in the Pantheon. Gradually were added a few paintings showing views of ancient monuments. "Ruins of the Monument of Philopapus [at Athens], Antique Tomb near the Via Tiburtina, View of the interior of the Thermes of Julian, The Temple of Vesta at Tivoli" Busts of Jupiter Serapis and of the Farnesian Hercules were presented by Archibald Robertson, as well as a few miscellaneous original antiquities Financially, however, the exhibition was unsuccessful, so that the casts were packed and stored away until the charter was procured in 1808 Thereupon the upper part of the "Government House" on Broadway, erected as the intended residence of the President of the United States and later used as the custom house (on the site of the present custom house), was borrowed for exhibition purposes. But when this structure was demolished in 1815 the casts were packed away for a second time in the store of Capt Farquhar on Vesey Street. The revival of the Academy by Governor DeWitt Clinton in 1816 resulted in the acquisition of new quarters in the abandoned old almshouse on Chambers Street, which, under its new name of the "New York Institution" now sheltered several cultural organizations under a common roof But the usefulness of the Academy rapidly declined, particularly on account of the accession, in 1825, of the group known as the New York Drawing Association, which was soon incorporated as the National Academy of Design After the New York Institution ceased to be available for the Academy in 1831, moreover, the collections were transferred to 8½ Barclay Street, near Broadway Here the Napoleon book collection and some of the works of art were destroyed during a fire in 1837, and the American Academy of the Fine Arts, after lying dormant for four years, was itself dissolved in 1841 and its records were given to the New York Historical Society But the casts survived and were bought for $400 by the National Academy of Design in 1841, and after having been in use for more than a century were in their turn destroyed by another fire in 1905

Among other casts and reproductions in New York at this time, Scudder's American Museum contained, according to the "Abridged Catalogue" of 1819, under the heading "Sculptor &c," the entry, "In bronze Apollo Belvidere." The National Academy of Design, moreover, before acquiring the casts from the American Academy, has been presented with "a cast of a dog from the antique" by Michael Paff, a "statue of Venus entering the bath" by Richard Wyatt, the "Farnese Hercules, a splendid colossal cast, being the only one on this side of the Atlantic" by G W Lee, the "Augustus (bust), Torso, and Antinoüs, of the Braschi palace (colossal)" by Mendes I Cohen, and "a number of casts of various descriptions" by Archibald and Alexander Robertson

Meanwhile, with the encouragement of the developments in New York, Peale's old project was revived in Philadelphia In 1804 Joseph Allen Smith, of Charleston, S C, "sent to America from Italy the Collection of Casts & Busts now deposited in Mr Peale's Museum," in accordance with a stipulation that it was to be "until such time as they form part of an American Academy of Fine Arts This part of the Museum [Arts and Antiquity, or Antique Room] is in the Philosophical Hall" A description of this part of the exhibit reveals that it "contains several fine casts from the celebrated Statues of Antiquity, deservedly the admiration of the world, such as the Apollo de Belvedere, the fighting and dying Gladiators, the Antinous, Meleager, Venus of the Capitol, Venus Calliope, the crouching Venus, Paris, together with Houdon's Diana, besides 12 Busts, and 10 Basso Relievos" When, in the new Academy building, "these casts executed in Italy" were united in 1807 with those specially made at Paris, it was felt that the former "are superior to those procured at Paris, both in work and materials" The American Philosophical Society also acquired some casts of its own, including "a model of Homer's head, from a bust found in Egypt, presented by M Du Ronchail, per Du Ponceau" in 1806

In 1806 Charles Willson Peale, William Rush (the sculptor), and Joseph Hopkinson (author of "Hail Columbia") drew up a proposal for the Pennsylvania Academy of the Fine Arts, signed by seventy-one prominent Philadelphians on December 26, 1805, its avowed purpose was "to promote the cultivation of the Fine Arts, in the United States of America, by introducing correct and elegant copies from works of the first masters in sculpture and painting and by this facilitating the access to such standards." A new building was erected for the Academy from the designs of Benjamin Latrobe A more comprehensive collection of casts was likewise demanded, and, having in mind the success of New York's appeal to Napoleon, a letter was sent to the American

Minister at Paris, now General Armstrong Again Napoleon proved to be agreeable, particularly in view of the fact that moulds already existed for most of the sculptures The selection was entrusted to the young secretary of the Legation at Paris, Nicholas Biddle of Philadelphia, with the advice of the sculptor Houdon, and more than fifty objects were prepared by "Getti, Mouleur du Louvre," as listed in the invoice of "20 Frimaire an 14" (Dec 11, 1805), including the Pythian Apollo, the Apollo Belvedere, the Antinous of the Belvedere and that of the Capitol, the Laocoon, the Torso Belvedere, the Meleager, the Capitoline Venus, the Dying Gladiator, the Fighting Gladiator, the Hermaphrodite, the Silenus and infant Bacchus, the Jason, and Germanicus The cases were shipped from Bordeaux in February, 1806, the Academy received its charter on March 28, and toward the end of that year, the building being nearly completed, the Academy opened with an exhibition of casts, with an admission fee of 25 cents, Mondays being reserved "with tender gallantry for ladies exclusively " In 1806, in writing to Col John Trumbull at New York with regard to the new American Academy of the Fine Arts in that city, Benjamin West had prophesied that New York and Philadelphia "would be the Athens and Corinth of the western world " But when West was elected to honorary membership in the Pennsylvania Academy, his letters to Charles W Peale and Samuel F B Morse in 1809–11 gave to Philadelphia the Athenian accolade "She may be looked up to as the [future] Athens of the Western World [or empire] in all that can give polish to the human mind "

But the creative artists of Philadelphia, few of whom had been included in the Academy, formed in 1810 the rival "Society of Artists of the United States," since, "not having received invitations to join the Academy, they concluded among themselves that the institution was intended merely for a museum, and consequently not likely to become of much importance, either in the improvement of artists or in correcting the public taste " By 1812 the new society successfully protested against the inclusion of the permanent exhibition of casts, as desired by the Academy, in the annual exhibitions of painting which they held in the Academy building

> The artists have ever deprecated the idea of an exhibition of antique statues, such being useful only to students, and never have in any other country formed a public exhibition It has been considered as extremely indecorous and altogether inconsistent with the purity of republican morals. . . There never ought to be any public exhibitions where both sexes cannot with propriety be admitted together.

Though the casts were thereupon eliminated from the annual exhibitions, the collection continued to grow General Armstrong on returning from Paris in 1810 presented books and an additional group of casts, while Mr Montgomery, of Philadelphia, in 1816 sent a cast of the Venus de' Medici from Florence, and Mr Wycoff gave small marble reproductions of the Venus de' Medici and the Antinous Even as late as 1845 the residents of Philadelphia were shocked by an exhibition of these casts from the antique And in that year most of them were destroyed in the fire which ruined the Academy building, only a few of the Napoleon casts now survive

In Boston, to which, despite Benjamin West, the appellation "Athens of America" has been more consistently applied, the new movement was somewhat belated The group of young men known as the "Society of Gentlemen" and later as the "Anthology Society," who had been meeting weekly since 1803 to prepare material for the *Monthly Anthology*, founded in 1805 a reading room which two years later became the Boston Athenaeum, in the first instance purely a library At one of the weekly dinners of 1809 John Stickney read "his article on Grecian pictures and statues which [was] accepted, Mr Buckminster, however, objecting, that there was too much nakedness in [it] " In 1811 a set of Paoletti's casts of antique gems was presented to the library, followed by casts of the Laocoon and of the Dying Gladiator by Solomon Willard (of Bunker Hill Monument) in 1817, and eleven other casts (including a duplicate of the Laocoon) by Augustus Thorndike in 1822 Said Ralph Waldo Emerson on June 3, 1822, the casts

> attract the eye in every corner from the tedious joys of writing & reading The beholder instantly feels the spirit of the connoisseur stealing over him, &, ere he can exorcise it, rubs up his Latin & Italian lore, & among the gazers, you may see the scholar, at pains to show his acquaintance with the lordly strangers, & his disdain of the "ignobile vulgus" who stare & stare, & are never the wiser

The Trustees reported on January 6, 1823 "As this Institution now possesses casts (with the exception of one) of *all* the most celebrated statues of antiquity, it is proposed to appropri-

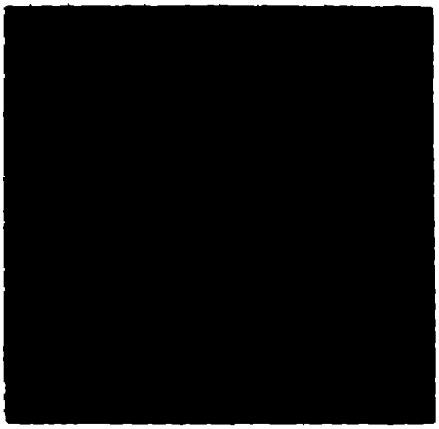

FIG. 6. The Laocoon.

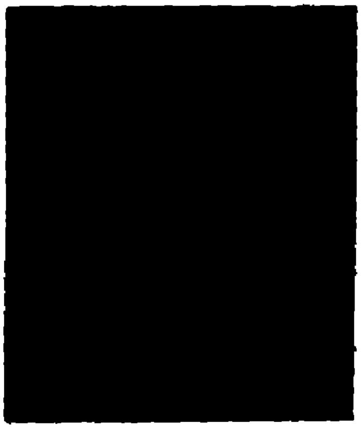

FIG. 7. The Apollo Belvedere.

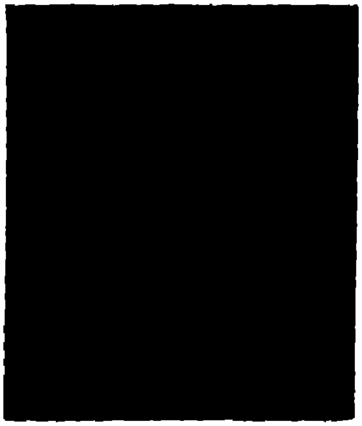

FIG. 8. The Venus de' Medici.

FIG. 9. The Dying Gladiator.

LATE HELLENISTIC GROUP OF DEMETER AND PERSEPHONE, MEGARA

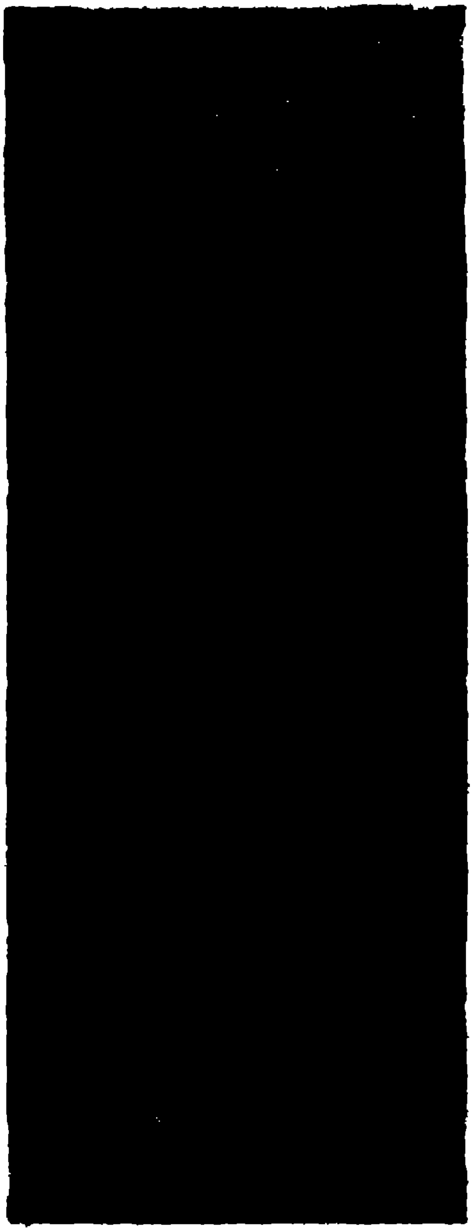

FIG. 10. Demeter brought to Philadelphia in 1828, now destroyed.
(Photo. by Ellwood C. Parry, Jr., through *Time*.)

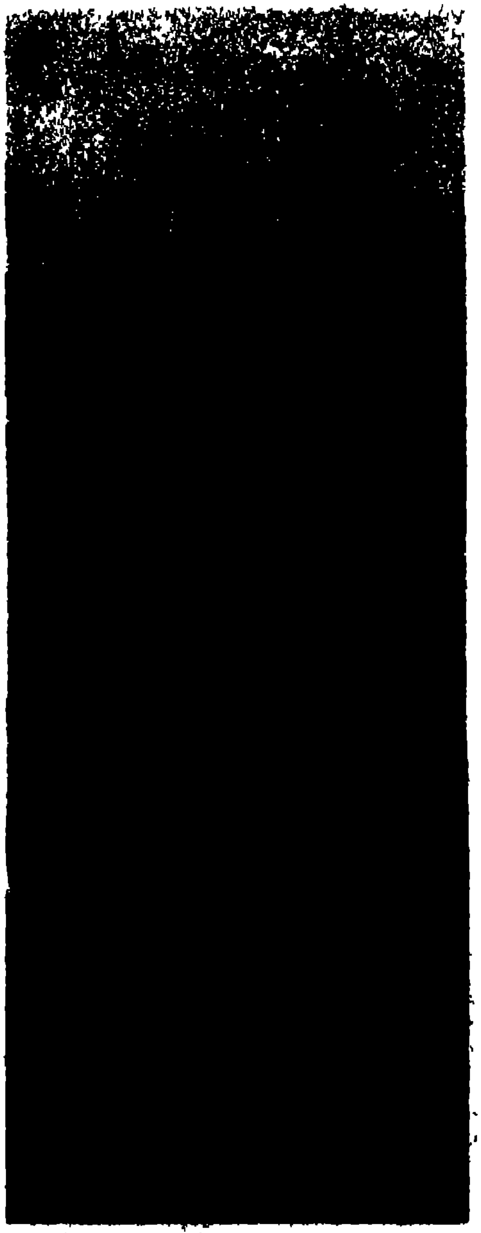

FIG. 11. Persephone, remaining at Megara.
(Photo from German Institute, Athens.)

ate the room . to a collection of works of art," or, according to a revised plan, to erect an annex or lecture room for exhibitions, on the ground that "that class of proprietors of the Athenaeum, who seldom frequent the Library, will *all* be capable of enjoying the Paintings and Statues, and have the opportunity of introducing strangers to the Museum of the Fine Arts" There was the other incentive that "in the city of Philadelphia, such an establishment was formed, twenty years since, at an expense of nearly one hundred thousand dollars" Additional casts were secured by 1825, and others directly from Italy in 1851 and 1858 All these were transferred to the newly founded Boston Museum of Fine Arts in 1876, and formed the nucleus of the vast assembly of dusty white casts in the zebra-striped museum in Copley Square, the medium through which we glimpsed classical civilization in the days of my youth

Among other casts arriving in Boston, one of the first was that purchased by William Sawyer about 1816 at Leghorn, namely, that of the Venus de' Medici (fig 8), which was deposited by Dr John Collins Warren in the Medical College It was of this cast that Horatio Greenough said, "he preferred it to the original at Florence as that was mended & discoloured which injured the harmony of feeling, whereas in this statue the sculpture & colour were perfect." This, too, was presented to the Athenaeum in 1861, and so passed into the collection of the Boston Museum of Fine Arts

A fourth center for plaster casts was Washington, where, even as early as 1842, the collection of the National Institute on the top floor of the Patent Office included "about 500 castings in plaster, medals and seals," and "ten pieces of statuary in marble, or plaster" In 1847, in connection with the organization of the Smithsonian Institution, a proposal was made to include

> plaster casts of some of the finest specimens of ancient and modern statuary It would further be desirable to commence the purchase of the models of antiquities, such as models in cork of some of the houses, temples, theatres, baths, &c , &c , in Pompeii and Herculaneum . [and] models of every interesting part of Pompeii which has been excavated, presenting in miniature a perfect view of nearly the whole on the scale of 1 foot to 150.

The plan was submitted by the Secretary of the Smithsonian, Professor Joseph Henry, to various organizations, including the American Academy of Arts and Sciences It is of interest to note the reply drawn up by a committee composed of Edward Everett, Asa Gray, Benjamin Pierce, Henry W Longfellow, and Jared Sparks

> The plan also contemplates a museum of the fine arts, it proposes to procure "casts of the most celebrated articles of ancient and modern sculpture" and "models of antiquities" While it is undoubtedly true, that a gallery of this description would find an appropriate place in an establishment devoted to the increase and diffusion of knowledge in its broadest sense, the committee cannot but hope that the immediate execution of this part of the plan will not be attempted, but that it will be deferred till other objects of more decided utility have been provided for

It may have been a result of such discouraging opinions that nothing was done on this occasion, though in 1857 the National Institute acquired a copy of the Dying Gladiator (fig 9) executed in Carrara marble by the English sculptor Joseph Gott "Its faithfulness, as a representation of the original, is vouched for by a certificate, among others, from our lamented countryman, Thomas Crawford" In 1859 it was resolved to expend $2000 "for procuring castings or moulds for castings of the chef d'oeuvres of art in Europe," and it was reported in 1860 that permission for making moulds or casts of celebrated statues in the Vatican had been obtained from Father Secchi at Rome, but the project was dropped at that point In the same year "the plaster figures received by the Institution from the Patent Office have been cleaned and repaired" A half-sized marble copy of the Apollo Belvedere was received from the Patent Office in 1862, and before 1865 there was also a plaster cast of the Venus de' Medici Many of these, together with the marble Gladiator, were destroyed in the fire of 1865, and others were stored in the Corcoran Gallery from 1876 to 1896

Classical Antiquities

The originals from classical lands brought to this country during the early years of the nineteenth century, by travelers abroad and also by returning naval and merchant ships, were of miscellaneous and haphazard character, usually of little artistic merit Thus Peale's Museum in Philadelphia exhibited an "Antique Pot, Household Gods, and bas reliefs, from the cities of Herculaneum and Pompeii," apparently part of the material given by Joseph Allen Smith of South Carolina and housed temporarily by the Philosophical Society, before being transferred to the Academy of Fine Arts To the latter, Mr Solomon in 1809 gave an antique mosaic Similarly, in the list of objects in Scudder's American Museum in New York in 1819 appear, under the heading "Antiquities," the items "Sugar dish and a small vessel found in the ruins of Herculaneum " In the same collection, under the heading "Minerals, Fossils, and Coins," were "Specimens of marble from ancient Carthage" and "Ditto from Italy " These were probably the ones exhibited later by Barnum "Antiquity has its relics in this apartment They consist of decorated marbles; and no one can contemplate them for a moment, without bearing testimony to the splendor of the fabrics of which these details were once a part " In 1824 "Roman Sarcophagi" were advertised as on view at the American Museum These again were later shown by Barnum "The lovers of antiquity and those who are curious in the customs of other countries, will be delighted with the *Roman Urns* for the preservation of [t]he ashes of the dead, both in their manufacture and their elaboration, they evince a high state of art," the illustrations showing one typical Etruscan terracotta funerary urn with a male figure reclining, head toward the right ("Roman Urns"), and another with a woman reclining, head to the left ("Sarcophagus") In 1828 the American Museum advertised articles *from Greece*, including Lord Byron's sword Most of these objects were apparently destroyed by fire, those at Philadelphia in the Academy fire of 1845, those at New York in the Barnum fire of 1865, but Byron's sword had merely been lent by the philhellene Col. Jonathan P Miller, and is now safely in the custody of the Vermont Historical Society.

Among the more permanent collections, the Boston Athenaeum received a marble relief of a horse from Herculaneum in 1812, given by William T. Andrews Certain objects listed among the property of the American Academy of the Fine Arts in New York as early as 1815 may also have been antiquities, viz,. "Mercury in bronze, presented by Frederick de Peyster, Esqr , Three Figures with civic crowns, in Bass-relief; A Mosaic tablet presented by the late William Seton Jun. Esqr., An Alabaster Vase with figures in Bass-relief presented by Mr. Smisseart, now mutilated "

As a typical example of the naval accumulations of the period we may cite the cruise of the frigate *Constitution* in the Mediterranean in 1824–28, as reported in the account of the schoolmaster and chaplain, George Jones, who was transferred to the *Constitution* with Captain Daniel Patterson while at Mahon (Minorca) early in 1826.[24] Thus on June 1, 1826, Jones among others visited the ruins of Carthage, which he described, and on returning was accompanied by four Moors "engaged in carrying to the boat, some large mosaics, which I had purchased " By June 10 the frigate dropped anchor at Melos, where Jones was particularly interested in the catacombs and bought a collection of glass and terracotta "tear bottles," securing more on July 24, 1827, at Aegina From Sunium, on August 14, 1826, he took pieces of a block of the temple "to show you the neatness of the fitting"; these he subsequently presented to Yale College

The anchorage of the *Constitution* while off Athens was habitually near the small island of Psyttalia, but on July 18, 1827, the frigate was moved over to the deep bay of Koulouri on the west side of the island of Salamis. Here it was

> that four or five emaciated Greeks ventured down to the beach, and made a signal to our ship They were soon brought on board, and two of them returned to the shore, loaded with provisions for their starving families in the mountains—the others offered to sell a statue of great value that was buried on shore, some distance up the Gulf The captain, regarding the purchase as an act of charity, readily agreed to give the stipulated sum . . . Everything was got in readiness for the expedition to start next morning at daylight—officers were appointed, men selected, a rude carriage constructed—boat provision and armed Our party consisted of twenty-five men, and in due time shoved off from the ship, and were scudding at a brisk rate with a fair wind. We soon arrived at the landing, and found the statue [fig 10] about three miles from the beach, buried some six or seven feet under ground It was no easy task to place it on the carriage: it could not have weighed less than five tons; and to transport it down to the boat, was a work of great labor and fatigue, the sun was oppressively hot, and the wheels sunk deep into the sand every roll. We reached the boat about an

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[24] [George Jones], *Sketches of Naval Life, with Notices of Men, Manners and Scenery on the Shores of the Mediterranean, in a series of letters from the* Brandywine *and* Constitution *frigates, by a "Civilian"* (2 vols., New Haven, 1829; I am indebted to Stephen B. Luce, Jr., for bringing to my attention a copy of this little-known work which had belonged to his grandfather and namesake, Admiral Luce) Reviewed in *American Quarterly Review* 6 216–239, 1829

hour before sunset, wearied, and fatigued beyond imagination [30]

George Jones adds some further details, though not from personal observation.

> The Captain formed a party to Megara, to-day (July 19): an invitation was sent me, to join them, but I was unfortunately ashore at the time . . They found there two colossal statues, with a smaller one; Captain Patterson purchased the last and one of the former, from a Greek, who professed to be their owner While making the purchase, another Greek passed into an adjoining church, dedicated to St Demetrius, and soon after returned, greatly alarmed, saying, that tears were flowing down the face of the saint, who must, therefore, be unwilling to part with it I have met with no people, whose superstition is so childish and absurd . The men employed by Lord Elgin, to carry his statues to the water, sometimes dropped them, and ran off, crying out, that the marble was complaining of its removal. Dr Clarke had great difficulty in procuring the Cambridge Ceres, at Eleusis, from a superstitious regard to the statue

With the statues safely on board, the *Constitution* moved on to Constantinople, Smyrna, and Genoa, finally reaching Boston on July 4, 1828, shortly before her destruction was ordered and fortunately averted by Oliver Wendell Holmes with his "Old Ironsides" in 1830 Both "Oceanus" and Jones agree that the colossal statue, a headless one, was given by Commodore Patterson to the Academy of the Fine Arts at Philadelphia, at Tenth and Chestnut Streets, where it stood under the largest hawthorn tree in America. The enthusiasm of "Oceanus" even permits him to add. "The grace and delicacy of the attitude and drapery of this statue, and its exquisite finish, must ever stamp it as a *chef d'oeuvre* of the most distinguished ancient chisel, and as a criterion of all that is beautiful and great in sculpture."[31]

The popular name of "Philadelphia's Ceres" given to this statue (fig 10) is probably justifiable; but more sober criticism would hardly follow the judgment of "Oceanus." While the general type goes back to the fourth century B. C., as on reliefs with the Eleusinian goddesses Demeter and Persephone now in Eleusis and Naples,[32] yet the details of the drapery indicate an origin as late as about 100 B C, in the late Hellenistic period—particularly the long drawn-out pouch of the peplos falling nearly to the knees, and the massed roll of the mantle around the figure just under the breast with the lower edge falling almost exactly to the bottom of the pouch The general scheme is apparent in a colossal marble statue in the Metropolitan Museum, but it is exactly reproduced in only one known statue— a colossal marble statue still remaining at Megara (fig. 11)[33] The latter is identical with the Philadelphia statue also in the technique of working the forearms and head separately, the latter set into a deep neck cavity worked with drill holes In fact, it seems probable that the statue remaining at Megara is the very one which Commodore Patterson saw but did not take, and that it was the ancient companion-piece of the Philadelphia statue, made at the same time and in the same atelier The more slender proportions of the figure at Megara, and the more matronly lines of the Philadelphia figure, suggest that if they are to be paired (as in figs 10-11) they must have represented Persephone and Demeter, respectively Thus they may have come from the famous temple of Demeter, the so-called Megaron on the eastern acropolis (Caria) which gave its name to the city

The fate of the Demeter is somewhat embarrassing to consider, in view of the fact that the events occurred only recently and in our own enlightened environment, rather than in Nazi-terrorized Europe For the statue survived the Academy fire of 1845 and continued to stand in the courtyard until, in 1876, it was elevated to a pedestal above the entrance of the new Academy building at Broad and Cherry Streets Here it stood for sixty-one years more, until the blackening surface showed signs of disintegration. On July 22, 1937, a representative of the Vermont Marble Company advised its removal, finding it a source of danger, two days later two Italian marble-cutters found cracks in it and advised that it be taken down, not as a whole—which would have cost a thousand dollars—but by the process of chipping and destroying it piecemeal, at a quarter of this price To such irresponsible counsel the statue fell a sacrifice on August 20 (fig 10), a single fragment carved as a modernistic drake is all that survives. Such was the fate of the largest piece of ancient sculpture brought to this country before the Civil War [20]

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[30] "Oceanus," "A Leaf from My Log Book," *American Monthly Magazine* 5: 448-449, 1835; reprinted in *Army and Navy Chronicle* 1 273, 1835, and by Elliot Snow and H. Allen Gosnell, *On the Decks of "Old Ironsides"* (New York, 1932) 153-155.

[31] No more is known of the fate of the smaller statue.

[32] *Cf* G E Rizzo, *Prassitele* (Milan-Rome, 1932), pls. CLII-CLIII I am indebted to Margarete Bieber for pointing out these and other analogies.

[33] With this statue is another of about the same date but with variant details, following fourth-century precedent a little more faithfully

In the very year of the arrival of the statue of Demeter occurred the spectacular discovery of Greek vases in the Etruscan graves of Vulci, on the estate of the Prince de Canino, Lucien Bonaparte, whom Ticknor had so liked Lucien, though living in Italy, had become a member of the Philosophical Society in 1823 There were other Bonapartes at that time living in Philadelphia, particularly "Joseph Bonaparte, formerly King of Spain, who has for some years resided in this country under the name of the Count de Survilliers His daughter married her cousin Charles, the son of Lucien Bonaparte, and they also lived in America, calling themselves the Prince and Princess de Musignano" Joseph had been elected to the Philosophical Society together with his brother, while Charles followed them a year later, in 1824 Thus it was natural that Lucien should send to Philadelphia a pair of Athenian red-figured vases (figs 12–13), a stamnos and a cylix,[21] as well as copies of his *Museum étrusque* [22] The cylix has attached under the foot a paper with the notice, "Fouilles de Canino 1831 Marche triumphale douze fig jaunes, nom d'Auteur inscrite " The book is inscribed. "Pour la bibliothèque de la société philosophique de Philadelphia—par Joseph Bonaparte C Survilliers—American Philosophical Society 20 July 1832 "[23] The Philosophical Society, under the date of June 17, 1836, has the following note of acquisition

> Mr Joseph Bonaparte, Count Survilliers, presented to the Society's Cabinet an Etruscan cup, very antique, found on the estate of Lucien Bonaparte, Prince of Canino, in the researches made in 1828–29 in that district. . This donation was accompanied by the "*Museum Etrusque* of Lucien Bonaparte," containing a description of nearly two thousand articles found in the same locality [24]

It is hardly to be doubted, therefore, that the stamnos likewise came from the Canino excavations of 1828–29 or shortly thereafter,[25] and that, while Joseph Bonaparte transmitted the *Museum étrusque* to the Philosophical Society in 1832 just before he left the country for the first time, he for some reason postponed the matter of the vases for four years, and then sent instructions that the cylix should be given to the Philosophical Society and the stamnos to Dr Nathaniel Chapman, through whom it descended to Dr Francis Lewis and thus was presented to Memorial Hall in 1899, reaching the University Museum in 1935

The stamnos, absolutely complete, is the older of the two vases, the work of the "Kleophrades Painter" just after 490 B C, showing on one side Heracles struggling with the Nemean lion, and on the other Theseus with the Marathonian bull The beautiful cylix, broken into about thirty pieces fitting together, is by the "Penthesilea Painter," dating from about 470 B. C, showing a youth pursuing a woman in the interior medallion, and youths with horses and men on the exterior. The foot of the vase bears the signature of Nikosthenes, which would be about fifty years too early for the body of the cylix itself; but it is obvious that the foot does not belong, having been attached in accordance with the arbitrary method of restoration followed by the early collectors and their agents.

Most of the haphazard accumulations of souvenirs by travelers in classical lands are too insig-

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[20] The records of the destruction are preserved in the files of the Pennsylvania Academy of the Fine Arts. An article in *Time* (1937, Aug 9, 52) states that the "Academy President asked the advice of sculptors on ways of *preserving* her weathered marble", but eleven days later it was destroyed I owe to *Time*, and to Ellwood C Parry, Jr, of Philadelphia, the unique photograph shown in figure 10

[21] The latter now in the hall of the Philosophical Society, Mary H Swindler, "Another Vase by the Master of the Penthesilea Cylix," *Am Journ. Archaeology* 13 142–150, 1909

[22] *Museum étrusque de Lucien Bonaparte Prince de Canino, Fouilles de 1828 à 1829, Vases peints avec inscriptions* (Viterbo, 1829–30)

[23] The Society held a meeting on that date, but the published entry merely records "Donations from eight persons and one society" (*Early Proceedings* 626) A duplicate copy of the text, inscribed "Madame Laetitia Bonaparte," was acquired by the Society at a much later date

[24] The Society held a meeting on that date, but the published entry merely records "Donations from Count Survilliers, and nine persons in the United States" (*Early Proceedings* 687) It is evident that the Count, who had left Philadelphia in 1832 but had come back to the United States in 1835, was now leaving with the intention of never returning, he reached London in August, 1836 (Hector Fleischmann, *Le Roi Joseph Bonaparte, lettres d'exil inédites* (Paris, 1912) 203, 211).

[25] It has been suggested that the stamnos was acquired by Joseph Bonaparte during the brief period when he was King of Naples (1806–08); see Dohan, *Am. Journ Archaeology* 39 (1935) 143. But this theory seems improbable in itself, and is unnecessary in view of the association with the cylix.

FIG. 12. Stamnos, University Museum, University of Pennsylvania.

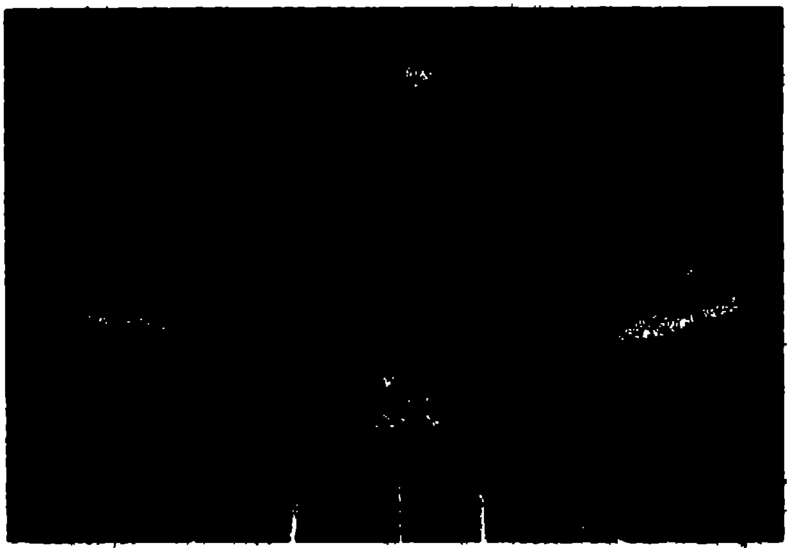
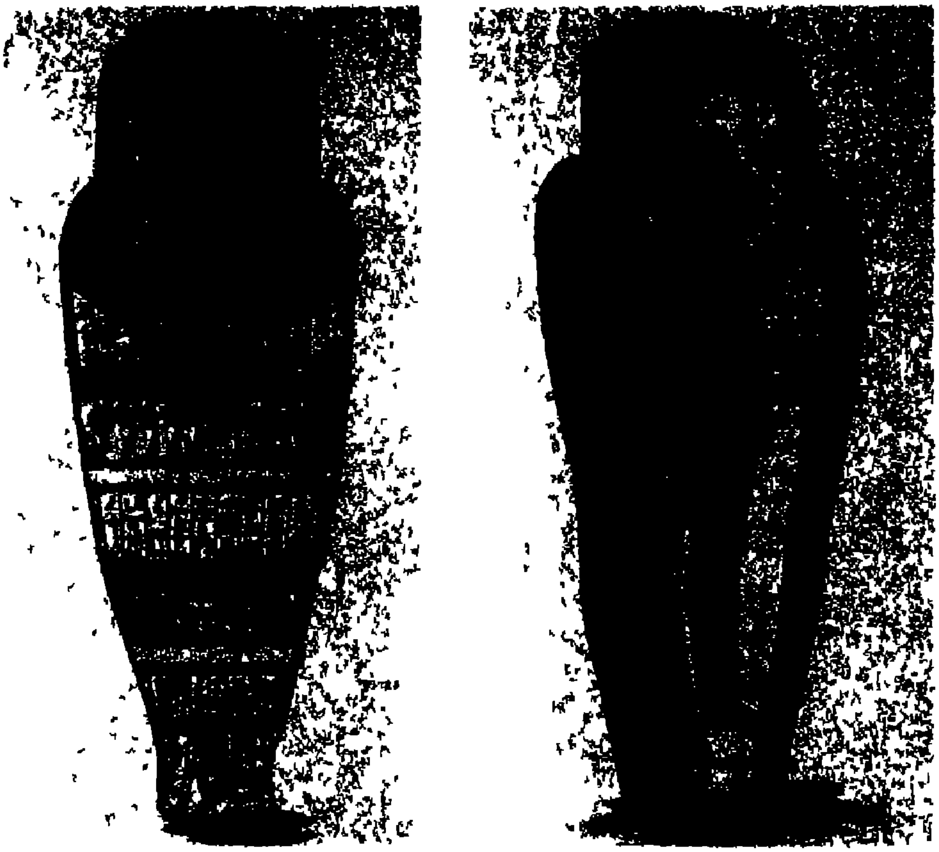


FIG. 13. Cylix, American Philosophical Society.

EGYPTIAN MUMMY-CASES BROUGHT TO AMERICA MORE THAN A CENTURY AGO



Figs 14–15. The first, in Massachusetts General Hospital, from Van Lennep (1823)

Fig. 16. Section in Smithsonian Institution, from Gliddon (1842).

nificant to require special notice. Such, for example, were the samples of limestone from the various temples at Paestum taken for examination by W. C Trevelyan on June 3, 1838 On the other hand, after the establishment of the National Institute in Washington in 1840, there was more incentive for government officials to bring materials home for this repository. Thus a marble "full-sized medallion of Minerva from Pompeii , and two other half-size ancient statues, all of elaborate finish," were mentioned as having been taken from the Patent Office to the Smithsonian Institution in 1862, and apparently were lost in the fire of 1865 A better fate was reserved for a bust of Ceres in porphyritic marble, and a marble bust of Bacchus (also called Bacchante) in high relief, those were rescued and transferred to the Corcoran Gallery, and since 1896 have been again in the National Gallery In 1859 "the Secretary of the Interior has sent to the Institution the large stone sarcophagus brought back from Syria [Beirut] by Commodore Elliott. It is an interesting relic of Roman sculpture "

A curious story attaches to a gold hair tettix and two pairs of gold earrings (fig 21) which arrived in New York in 1852, as part of the Abbott collection of Egyptian antiquities, and so passed into the collection of the New York Historical Society[36] For, though Greek, they were reported to have come from "Upper Egypt " Actually, however, they were excavated on the island of Ithaca in the winter of 1812 13[37] The chief discoverer was apparently John Fiott Lee, who published an account of the excavations, while another list of some of the material is given by an English traveler, Thomas Smart Hughes[38] It so happened that Lee, having arrived at Zante on October 26, 1812, coming from the Morea, crossed to Cephalonia on December 14 and thence, with "another English gentleman," on December 23 crossed to Ithaca Three other friends (including Jakob Linckh and Baron Otto Magnus von Stackelberg) crossed from Cephalonia to join them Together they began excavating graves on Mount Aito on December 27, but were stopped two days later by the commandant of the island, "Captain Guitiera (who) was an officer of the Corsicans in our pay I recollect that you once informed me," wrote Lee to Capt W H Smyth, that "he afterwards obtained an unenviable notoriety in Ithaca, from having melted a number of silver vases which he had disinterred, in order to make spoons and forks of the metal and that Colonel de Bosset (Lieutenant-governor of Cephalonia) assured you that he had actually seen the latter in use!"[39] The balked excavators divided their booty into five piles and drew lots for their shares But as Lee departed on an excursion, Captain Guitiera took over the area and conducted excavations on his own account, with the result that Lee and his colleagues reassembled on January 3, 1813, reopening the excavations in defiance of the commandant and being again stopped the next day, though not before they had acquired additional rich material On January 5

> we again assembled the respective shareholders, divided our spoil into lots, and drew for them, and one of my companions, the accomplished Baron Stackelberg, kindly made drawings of several of the most interesting articles, in my journal Besides my share, I obtained some of the other antiquities by purchase or exchange

The drawings of Stackelberg were published in 1837, others by Lee in 1849, and finally in 1891 appeared those of Baron Haller von Hallerstein, one of the excavators of the temple at Bassae, who had not been present at the excavations of 1812–13, though he himself crossed over to Ithaca from Zante, after the sale of the Bassae marbles, for the purpose of making excavations in June, 1814. It is probable that on this occasion Haller sketched the gold tettix, which was then in the possession of "the English Captain Guiterre," according to his notes, the two pairs of earrings may have been sketched at the same time, since they bear only his notation that they were found at Aito and Stavro on Ithaca, without indication of ownership. Others of Haller's sketches of the jewelry from this find, however, were apparently made in Athens on seeing the booty in the hands of his friends, since a necklace from Mount Aito is recorded as belonging to Linckh, and other materials as having been bought or found by Thomas Burgon at Ithaca. It is possible that Captain Guitiera sold his jewelry to some traveler who went afterwards to Egypt and carried the jewelry with him, thus accounting for its appearance in the Abbott collection before the compilation of its first catalogue in 1843.

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[36] [Joseph Bonomi], *Catalogue of a Collection of Egyptian Antiquities, the Property of Henry Abbott, Esq , M D* (Cairo, 1846, but dated 1843 at end) 33, nos. 27, 31–32, newer eds. (New York, 1853, etc), nos 1074, 1091–92, 1094–95, *Catalogue of the Egyptian Antiquities of the New York Historical Society* (New York, 1915), nos 1069, 1087–88, 1091–92, Caroline R Williams, *The New York Historical Society· Catalogue of Egyptian Antiquities (Numbers 1–160), Gold and Silver Jewelry and Related Objects* (New York, 1924) 147–153, nos. 85–89, pls. 18, 23

[37] The identification was made by Mrs. Williams; I have been able to add a few details from contemporary records

[38] John Lee, "Antiquarian Researches in the Ionian Islands, in the year 1812," *Archaeologia* 33· 36–54, pls 2–3, 1849, Rev Thomas S. Hughes, *Travels in Greece and Albania* (London, 1820) 1: 161–166, 2nd ed., 1830, 1 159–163).

[39] Lee, *op cit* · 45, note *a* It was suggested by Mrs. Williams that "Captain Guiterre," *whose name appears* on one of the Haller drawings, might have been a captain of a merchant vessel who transported the jewelry to Egypt.

Classical Gems and Coins

These smaller and easily transported antiquities, both originals and casts, may be considered apart from the larger objects. Casts of gems were manufactured for tourists by the Paoletti brothers on the Piazza di Spagna at Rome, set in velvet-lined cases in the form of books; such a set was given to the Boston Athenaeum, for instance, in 1811. The Joseph Allen Smith collection sent from Italy and exhibited in Independence Hall at Philadelphia from 1804, and later in the Academy of Fine Arts, contained "1400 elegant casts from antique gems" or, more specifically, "an invaluable collection of medals, gems, and intaglios executed in the finest manner, amounting to above fifteen hundred," some of these, therefore, being casts of coins. Varden's Washington Museum between 1829 and 1841 had "about 500 castings in plaster, medals and seals," according to a report of Jan. 1, 1842, at the time of their acquisition by the National Institute. The National Academy of Design in New York had before 1834 "a valuable collection of impressions from antique and modern gems, presented by Lieut. G. W. Williams, of the engineer corps." A naval officer reported in 1834 with regard to an American in London, J. Doubleday at 22 Little Russell and Museum Streets, who made casts of gems and coins in sulphur from the British Museum and Bibliothèque nationale, having 6000 moulds for Greek and 3850 for Roman, which could be supplied on demand. Real gems also began to accumulate. The private cabinet of John G. Bogert of New York, exhibited in 1817 by the New York Historical Society, contained about 120 ancient gems. And Miss Susan Burley, of Salem, Mass., was noted as an amateur of antique gems.

Turning to the subject of numismatics, we note that in 1805 Thomas Jefferson received from N. H. Weinwich, Secretary of the Royal Society of Heraldry and Genealogy in Denmark, one hundred and fifty Roman bronze coins from Augustus to Theodosius. "He deposits them with the A[merican] P[hilosophical] S[ociety], believing them well worthy its acceptance," and they were duly labelled and catalogued by the librarian, John Vaughan. Eleven years later the Society received from David Parrish "a valuable collection of *Ancient Medals* and coins . . . for safe keeping, subject to his order and to instruction given to the Librarian." Other donations were received in 1834 from Capt. Daniel Geissinger, Peter S. Du Ponceau ("the *ancient* coins presented by the President of the Society"), and Joshua F. Fisher, and in 1835 from William B. Hodgson, consul at Algiers ("Turkish, Egyptian and Greek Coins"). A committee was appointed in 1837 to arrange the medals and coins. The collection was shown in combination with material from the Library Company and the Numismatic and Antiquarian Society of Philadelphia at the Centennial Exposition in Memorial Hall, and was discussed in two papers read before the Society by Henry Phillips, Jr., in 1879.

At New York the Rev. John C. Kunze, pastor of the Lutheran Church in Frankfort Street between 1784 and 1807, had formed an extensive and valuable collection of coins and medals, presented by his heirs to the New York Historical Society in 1818, but these were stolen a few years later. Just before this, however, the Historical Society had received from John G. Bogert a cabinet of coins and medals, ancient as well as modern; most of his Greek coins had been acquired directly from Athens through a friend "who had been a fellow traveller with Lord Elgin, in exploring and examining the ancient sepulchres of the Greeks, and who had peculiar advantages from his situation in procuring some very rare specimens."[illegible]

Meanwhile, in the Tammany Museum which had now become Scudder's American Museum, the collection was advertised as containing three hundred ancient coins in 1811, and "coins ancient and modern of all nations" in 1813–14. This is the same collection that appears in the "Abridged Catalogue" of 1819, under the classification "Minerals, Fossils, and Coins," as "A large vari-

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[illegible] *American Monthly Magazine*, 1: 132, 374–375, 1817.

ety of Silver and Copper *Coins*, of all Nations; among them are, a great variety of ancient Roman and Egyptian Coins." This collection was now housed in the same building, the "New York Institution," which sheltered the Historical Society, and evidently the robbery which resulted in the loss of the Kunze collection coincided with a third depredation of this kind in the old Tammany collection, but in 1826 the American Museum was able to announce that the valuable collection of coins stolen from the institution was again on exhibition together with the handcuffs and fetters cut in two by the thief in his endeavor to escape from prison. Removed with the rest of the American Museum collections to the new building on Broadway and Ann Street in 1830, the coins there came under Barnum's control in 1841, for "the old Museum [Barnum's] contained a very fair cabinet" which presumably perished in the great fire of 1865.

At Fayetteville, Tennessee, was found a Roman coin with the busts of "Antoninus Aug Pius P. P III cos." and "Aurelius Caesar Aug P. III cos" on opposite faces, arousing considerable speculation as to whether it had been dropped by Ferdinand de Soto's men in 1544 while constructing earth works [41]

George Jones, of the frigate *Constitution*, had a special interest in coins and reveals some of the conditions of collecting in the Levant during 1826–27. At every Aegean port he asked for "pholis" or "gazzettas", on the sites themselves he acquired coins of Chios and Eleusis; and "we were offered a great many antique medals at Coulouri (Salamis)· from among them, I purchased a leaden one, of a curious character. It has the body and legs of a fowl: the head of a horse: a man's face on the breast, and a serpent rising from the body" The coin dealers of Smyrna are mentioned as the chief sources of supply for European collections. He says

> Zyra [Syra] has a manufactory of antique medals, and supplies the Levant with that article. among a vast number of counterfeits, however, I made out to get some valuable ones of genuine character. It is easy to distinguish them. Sometimes the figures are cut with a steel, and then their rudeness always betrays them: usually, however, they are cast, and these can be detected, immediately, by their roughness of surface. . . . These remarks are confined to those of silver, the copper ones are always genuine, the labor of casting, would overrun the profit, and I have never yet seen a counterfeit of that metal. . . I have since examined the medals in the windows of the shops at Rome I may be useful to other travellers, to state that those of copper are genuine but of all those of silver, I did not seen one that was not a counterfeit

The earlier private collectors in this country did not specialize in Greek and Roman coins, these appeared only as portions of their general collections, and such is the scarcity of information that it is now difficult to ascertain just what they possessed Among private collections, the first of great importance was that formed by Joseph J Mickley, of Philadelphia, sometimes called the father of American numismatics; he had begun collecting at about 1820, and his coins were sold at auction in 1867 This collection was eventually surpassed by that of William S Appleton, of Boston, who had many ancient coins John W. Draper, of Christiansville, Virginia, described an English collection which was in his hands in 1835 for disposition Capt Wilson Defendorf, of the Army, had a collection of Greek pieces, tetradrachms of Syrian kings, Alexander the Great, Athens, Syracuse, etc Thomas H. Johns, of Canandaigua, New York, had made a collection which the Corporation of Yale College voted in 1854 to accept in place of part of the sum left in his will, and this Yale collection was further enlarged by Frank Parsons Brewer in 1860, who wrote in the same year on "Roman Family Coins in the Yale College Collection." During excavations at Sidon in 1852 a great hoard of 3600 gold coins of Philip and Alexander was discovered, this being the cause of the excavations which led to the discovery of the first Sidonian sarcophagi, several of these coins were sent to the United States, two of them reaching the cabinet of the American Oriental Society. Among other coins sent to the same society were coins of Alexander the Great, Philip son of Antiochus VIII, and Bolagasus of Parthia (from Henry Lobdell in 1854), and thirty-six copper coins of Alexandria in the Roman imperial period acquired in 1856–60. Professor Cornelius C Felton in 1855 "exhibited to the meeting (of the American Academy of Arts and Sciences) a series of silver coins of Athens, which he had lately received from Mr George Finlay of Athens"

Coins were shown also in Varden's Washington Museum between 1829 and 1841, and in the latter year passed into the collections of the National Institute, along with "about 500 castings in plaster, medals and seals" as mentioned above. Included in the proposal of 1847 for the Smithsonian were "also a few antique coins and medals, sufficient to convey some illustration of numismatics, as a subsidiary branch of history." Nothing seems to have been done about this, and what the Institute had were shown on the upper floor of the Patent Office until 1862, and then were removed to the upper part of the Smithsonian building, only to be destroyed, presumably, in the fire of January 24, 1865.

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[41] *Am. Monthly Magazine*, 3: 381, 1818; 4. 74–75, 1818.

In the Mint of the United States, moreover, specimens sent in for melting had been saved from time to time if they were in good condition, and by 1838 it was decided to form a representative collection. Coins brought from abroad were gradually added, such as an Athenian coin given by Capt. Gardner of the Navy. J. G. Schwartz, United States Consul at Vienna, contributed "the greater part of our ancient coins, being a private collection the result of twenty years assiduity;" also John P. Brown, of the United States Legation at Constantinople, sent Greek coins, and Dr. Asahel Grant, of the Nestorian Mission, ancient Persian; there was also a coin of Ptolemy II found in Assyria in 1856. Catalogues were published in 1846, 1851, and 1860.

In 1858 were founded, practically simultaneously, the two most important numismatic societies, the American Numismatic and Archaeological Society in New York, and the Numismatic and Antiquarian Society of Philadelphia. The Philadelphia society began the publication of *Miscellaneous Papers* in 1858, and of its *Journal* in 1865, the American Society did not begin to issue its *Journal* until 1866. The coins of the Philadelphia society were on exhibition, combined with those of the American Philosophical Society and of the Library Company of Philadelphia, in Memorial Hall at Fairmount Park during and after the Centennial Exhibition of 1876. But in the periodicals there was still a great dearth of material: as Charles E. Anthon reported editorially as late as 1868, "the intensely interesting subjects of Greek and Roman Numismatics have barely been touched on in our pages. Our silence on such themes [is due] . . . to the comparative difficulty of obtaining specimens for study." American recognition of the true importance of ancient coins was still in the future.

NINETEENTH CENTURY: EGYPTIAN ARCHAEOLOGY

During the first third of the century our contacts with Egyptian civilization were few and for the most part at second-hand, consisting in large part of reprints or reviews of foreign books intended to satisfy the sudden demand for knowledge of Egypt resulting from the notoriety of the Bonaparte expedition. Thus Vivant Denon's *Travels in Upper and Lower Egypt* was published in translation by Arthur Aiken at New York in 1803, William Wittman's *Travels in Turkey . . . and Egypt in 1799, 1800, and 1801* appeared in Philadelphia in 1804, Edward Daniel Clarke's *Travels in Various Countries of Europe, Asia and Africa* in New York in 1813, Charles Thompson's imaginary *Travels through Turkey in Asia, the Holy Land, Arabia, Egypt, and Other Parts of the World* at Carlisle (Pa.) in the same year, as well as translations of Chateaubriand's *Travels in Greece, Palestine, Egypt and Barbary, 1806–1807,* in New York in 1814, and of Frederik Ludvig Norden's *Travels through Egypt and Nubia* in New Haven in the same year. Brief articles began to appear in the periodicals, compilations such as that on the "Ruins of Thebes or Luxore" from Pococke and Norden, or reprints such as the "Account of the Sepulchral Caverns of Egypt" from the *Edinburgh Philosophical Journal*. Among the works of the early excavators, that of Belzoni as described by Sarah Atkins in her *Fruits of Enterprise* was republished at Boston in 1824. The decipherment by Champollion received attention in lengthy reviews of 1827–28,[42] while the secondary book on the same subject by Vicar-general Greppo was actually translated at Boston by Isaac Stuart in 1830 and in its turn formed the subject of reviews.[43] The great *Description de l'Égypte*, and Quatremère de Quincy's essay on Egyptian architecture, were likewise reviewed in 1829.[44] But the earliest nineteenth-century American monograph on this part of the world, by Henry A. S. Dearborn in 1819, was like that of Remmey twenty years earlier, a mere compilation.

During this period, to be sure, there had been Americans in Egypt, but hardly for archaeological purposes. It was from Egypt that Captain William Eaton set forth in 1804 at the head of eight United States marines, thirty-eight Greeks, ninety Tripolitans, and a troop of three hundred Arab camel cavalry, and captured Derna. The prestige of the American Navy at the conclusion of the War with Tripoli in 1805 was so great that a few Americans were encouraged to settle in Egypt; and the necessity of continuous patrol for the protection of American commerce against the Barbary pirates resulted in frequent visits by American warships. Thus when the Englishman Thomas Legh (one of the six "Proprietors" of the Bassae marbles now in the British Museum) reached Cairo in 1813, he found there a former American naval officer named Barthow who had resided in Egypt for so many years that he was engaged to serve as Legh's interpreter, ascending the Nile as far as Ibrim near Dongola in Nubia Their thrilling adventures were published by Legh at London in 1815, with an American edition at Philadelphia in 1817 R. B Jones, afterwards United States consul-general in Egypt (1853), had been an officer of our navy in the time of Mehemet Ali, in whose service was also George Bethune English, who took part in an expedition up the Nile to Dongola and Sennaar, which he published as the first original American contribution to Egyptian travel literature And Yankee naval architects were employed at Alexandria for the building of an Egyptian fleet for Mehemet Ali, the very fleet which was later engaged by the Sultan of Turkey to suppress the insurgent Greeks whom other Americans in turn were obliged to succor Another American contact was through the painter William James Bennett, born in London and sent with the British forces in 1805 to Egypt, where he made views of the country, before coming to the United States in 1816.

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[42] *American Quarterly Review*, 1: 438–458, 1827, 2: 509–533, 1827, 4: 27–53, 1828.

[43] *North American Review*, 32: 95–127, 1830, *Am. Quart. Rev.*, 9: 339–351, 1831.

[44] *Am. Quart. Rev.*, 5: 1–41, 1829.

The first Egyptian relics[48] to come to this country were mummies, beginning with one (figs 14–15) presented in 1823 by Richard Van Lennep, a merchant of Smyrna, "to the good people of Boston, as an expression of his gratitude for their kind hospitality during his residence among them." This mummy, which with its case came from Thebes, was entrusted to the newly founded Massachusetts General Hospital, and it has remained continuously in the Hospital ever since, apart from a few lucrative excursions and a brief sojourn (1885–1896) in the Boston Museum of Fine Arts. During its first year in America the same mummy "from the Catacombs of ancient Thebes, . . . the only Mummy ever brought to America," was exhibited in "the first room of the passage leading to the [American] Academy of [the Fine] Arts, New York Institution" These exhibitions offered such a welcome alternative to the classical casts that several thousands of dollars were extracted from the pockets of the curious for the upkeep of the Hospital, and at the same time the mummy excited so much suspicion that Dr John Collins Warren was obliged in 1823 to write, in defense of its authenticity, the first scientific American paper on Egyptology, the *Description of an Egyptian Mummy.* It was probably the same relic that was again brought to New York in 1824, and exhibited until March of 1825 at Broadway and Reed Street Not to be outdone, Rubens Peale had two mummies exported directly from Cairo to New York by an Egyptian agent, these were placed on exhibition in Peale's Museum in 1826, and after sixteen days a special attraction announced for the edification of "the scientific and curious" was the partial unwrapping of the mummies "by several of the most respectable physicians of this city in the Lecture Room of Peale's Museum," admission fee 25 cents, "N B. On this occasion, children cannot be admitted." One of these mummies seems to have suffered from too much handling, but the other, still on exhibition in 1827, might "be viewed by the most delicate female without exciting the smallest disagreeable feeling" In 1832 the rival American Museum advertised a mummy just received from Thebes; whereupon Peale's Museum countered two days later with "the finest ever brought to this country" (i e, the survivor of 1826?); and the American Museum had the last word by announcing a public dissection of its mummy nineteen days later, "after which it will remain in state, for the gratification of the curious." Thus only Peale's mummy seems to have survived such ordeals, and was advertised again in 1835, and finally sold, along with the rest of the contents of Peale's Museum (then called the New York Museum), to Phineas T. Barnum in 1843; thus it was shown for many years afterwards in Barnum's American Museum and was probably lost in the great fire which destroyed this museum on July 13, 1865.

Under the influence of these somewhat inadequate contacts, and based primarily, therefore, on the few available imported books such as the *Description de l'Égypte* and Quatremère de Quincy's essay on Egyptian architecture, a brief Egyptian revival affected the architectural trend of a dozen years during the thirties and forties.

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[48] For a survey of Egyptian studies in the New York area, see Caroline Ransom Williams, "The Place of the New York Historical Society in the Growth of American Interest in Egyptology," *Quart. Bull. New York Hist. Soc.*, 4: 3–20, 1920.

Men such as Robert Mills, Solomon Willard, Alexander Jackson Davis, John Haviland, and Thomas S Stewart—all steeped in the tradition of the Greek revival—experimented with the exotic forms of Egypt. Obelisks such as the Washington Monument and that on Bunker Hill, and Egyptian façades and portals such as those of the New York Halls of Justice ("the new prison known as the Tombs, so-called from the fact of their being of the Egyptian style of architecture"), the Newark Court House, the Egypt Building of the Medical College of Virginia at Richmond, and the Egyptian Reservoir on Fifth Avenue in New York, all formed part of a somewhat belated reflection of the French publications of the Bonaparte expedition By the time that American research and travel had brought us into direct contact with the originals, the Egyptian revival had passed away

The beginning of the Egyptian revival coincided, however, with the arrival of the vanguard of a great American invasion of Egypt beginning with 1832, the Nile became the winter resort of invalids and of the wealthy To cope with this situation, the opening of diplomatic relations became desirable, the first consular agent was located at Alexandria in 1832, the first consul general at Cairo in 1849 The first consular agent was an Englishman, John Gliddon, who had long been a resident of Alexandria, and his subordinate at Cairo was at first his son, George Robins Gliddon, and afterwards his son-in-law, Tod The vast number of travel books of this period constitute an essential part of the picture, but we can hardly undertake to analyze or even to list them in this survey Some idea of their number may be obtained from the names in the consular register of Alexandria for the decade 1832–42, as published by the younger Gliddon [46] For instance, in 1835 came John Lloyd Stephens, of New York, who in 1836 ascended the Nile to Nubia, and published his travels under the pseudonym of "Abdel Hasis" Dr Valentine Mott and Samuel Waring, of New York, came to Egypt in 1838, but ascended no farther than Cairo, visiting the pyramid field and taking specimens of the great pyramid and limbs of mummies as souvenirs The next year came James Ewing Cooley, of New York, ascending the Nile as far as Philae, writing an account which caricatured British and American tourists in Egypt under pseudonyms such as Dr O'Squeebey (Dr. Henry Abbott, of Cairo), his exaggerated descriptions of the mad scramble for souvenirs and fragments of mummies, as well as aspersions upon the American consular authorities, aroused the ire of George R Gliddon, who encountered him between Syene and Thebes in February, 1840, and was afterwards inspired to write a bitter criticism of Cooley's book

The interests of Dr Samuel George Morton, of Philadelphia, who gained his impressions of Egyptian archaeology from visits to European museums, were primarily anthropological, and he was responsible for the importation of Philadelphia's mummy in 1833, though it was such a very delapidated one that he mounted it as a skeleton for the Anatomical Museum of the University of Pennsylvania [47]

The first American collection of Egyptian antiquities was assembled at Thebes in 1832 by Col Mendes I Cohen, of Baltimore, who sailed his own ship up the Nile from Damietta to Wady Halfa After his death the collection was given to The Johns Hopkins University (fig 17) [48] In 1833 came John W Hamersley, of New York, who accumulated a collection of Egyptian antiquities which was eventually donated to Columbia College [49] A year later, again, John Lowell, Jr, reached Alexandria, on December 27, 1834, to begin his fatal year in Egypt On the summit of the Temple of Luxor, he drew up a long codicil to his will, outlining the plans for the Lowell Lectures, "to be delivered in Boston, upon philosophy, natural history, the arts and sciences." As Edward Everett said in fulsome phrases five years later, "The few sentences penned, with a tired hand, by our fellow-citizen, on the top of a palace of the Pharaohs [read, temple at Luxor], will do more for human improvement, than, for

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[46] Gliddon, *Appendix to 'The American in Egypt'* (Philadelphia, 1842)· 28–30, *North American* (Philadelphia), Feb 10, 1847

[47] This mummy was reputed to have come from Thebes, purchased from the heirs of Lebolo (*Trans Am Phil. Soc* 9 124, 1846) For an account of the examination of a mummy at the Academy of Natural Sciences in Philadelphia in 1833, see *Am. Quarterly Review* 18 183–184, 1835

[48] I am indebted to David M Robinson for the illustration of three of the ushabtis from this unpublished collection

[49] The Minutes of the Trustees of Columbia College for Nov 2, 1874, contain the entry, "Resolved, that the thanks of the Trustees be presented to John W Hamersley Esq. for the interesting collection of Egyptian curiosities presented by him to the College and that these objects be suitably arranged in a case by themselves under the direction of the President, and marked with the name of the donor" A wooden mummy-case now at the University is perhaps the sole identifiable relic of this collection.

FIG. 17. Ushabtis, in the Cohen collection (The Johns Hopkins University Archaeological Museum).

FIG 18. Piece of obelisk of Hatshepsut, Lowell collection (Courtesy of Museum of Fine Arts, Boston)

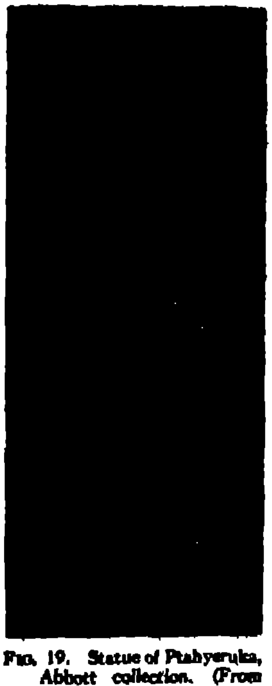

FIG. 19. Statue of Ptahyeruka, Abbott collection. (From the collection of the New York Historical Society in the Brooklyn Museum.)

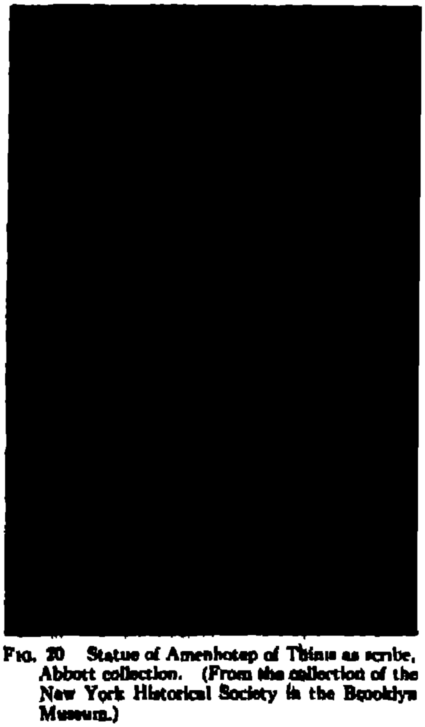

FIG. 20 Statue of Amenhotep of Thinis as scribe, Abbott collection. (From the collection of the New York Historical Society in the Brooklyn Museum.)

NON-EGYPTIAN OBJECTS IN THE ABBOTT COLLECTION

(From the collection of the New York Historical Society in the Brooklyn Museum)

Fig. 21. Gold earrings from Ithaca, with drawing by Haller (above).

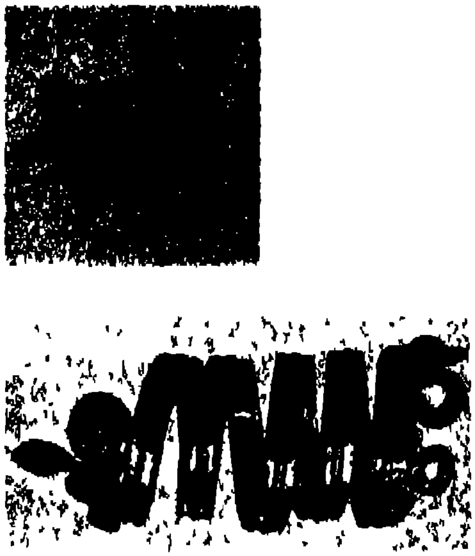

Fig. 22. Gold hair tettix from Ithaca, with drawing by Haller (above).

Fig. 23. Cretan vase from Lower Egypt.

aught that appears, was done by all of that gloomy dynasty that ever reigned " At Thebes, moreover, Lowell gathered a collection of antiquities which include several interesting pieces,[80] such as two fragments of the obelisk of Queen Hatshepsut at Karnak (fig 18);[81] a black granite seated figure of the goddess Sekhmet, and a fragment of another, from the great cache at the temple of Karnak, a colossal red granite head of a king of the Eighteenth Dynasty, a large fragment of a granite wall relief of the Eighteenth or Nineteenth Dynasty, fragments of a late Egyptian basalt anthropoid sarcophagus, two sandstone Ptolemaic column capitals, also a few vases and Canopic jars, scarabs, amulets, beads, minor utensils, papyri, and mummies

Continuing to ascend the Nile, he was confined by illness at Philae for three weeks, and for four weeks at Wady Halfa, and thence went overland to Meroe in the middle of September, filling his journal with detailed measurements By the middle of November he was at Khartoum Crossing the desert to Sowakeen on the Red Sea, he reached Mocha on January 1, 1836, after a shipwreck, and died at Bombay on March 4 as a result of his long exposure in Egypt The materials which he had acquired were eventually delivered to his family in Boston, and by them in turn, in 1875 and 1922, were given to the Boston Museum of Fine Arts

George Robins Gliddon, the son of our first consular agent at Alexandria, and himself for a while vice consul at Cairo, became an enthusiastic Egyptologist, he was befriended and helped by Richard K Haight, of New York, and Richard Randolph, of Philadelphia, who visited Egypt in 1836 and were among the members of the "Egyptian Society" at Cairo, of which the British resident, Dr. Henry Abbott, was secretary Haight financed Gliddon's studies in Paris and bought many books to help him when he visited the United States in 1837–38 and again in 1842-50 [82] To the National Institute, at Washington, Gliddon presented in 1842 several

> Egyptian antiquities and hieroglyphs which are specially worthy of notice, and give a juster idea of the style of the works of that wonderful people than could be acquired from plates Some of these fragments have long been wanted in this country, and will be looked at with the more interest as the extraordinary and authentic annals disclosed by them become more generally known

Among these was a limestone human-headed sphinx about two feet high, also one-third of a mummy-case (fig 16), these and some other antiquities survived the fire of 1865 and are still in the Smithsonian, though the other parts of the mummy-case, divided between Mrs Ward, of New York, and the Naval Lyceum at Brooklyn, are now lost Gliddon's chief claim to importance is the fact that he was the first to lecture on Egyptology in this country He gave a series of thirteen lectures in Boston in 1842 43, these being published at New York in 1843 and running through fifteen editions in the next seven years He gave the Lowell Lectures at Boston in 1843 44, and afterwards toured as far as St Louis, lecturing before audiences numbering as many as 2000 His habit was to stand between two tables one piled high with books on Egyptology, the other with relics borrowed from the collection of the British consul general A C Harris at Alexandria a collection which, by the way, was offered for sale to the Philosophical Society in 1868[83] and all around were hung painted charts enlarged from Rosselini's *Monumenti* All Europe marvelled at his success, and even more at the lecture-going habits of the Americans the Lyceum movement was then in its heyday Toward the end of his sojourn Gliddon indulged in more popular forms of entertainment, exhibiting a transparent panorama of the Nile, through Egypt and Nubia, at the New York Chinese Museum (539 Broadway) during the winter of 1849–50, as well as Egyptian mummies In connection with the latter he gave in 1850, likewise in New York, one of those unwrapping performances which Rubens Peale had popularized Gliddon first read the inscription on the outside and announced the name of the female inmate, which further investigation "proved to be a male, very friable," greatly to the amusement of the audience The Egyptian vendor apparently had assorted mummies and coffins with little regard to inscriptions

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[80] I was informed by Dr A Lawrence Lowell, shortly before his death, that "the drawings and water colors by the Swiss artist, Gleyre, have been retained by the Trustee of the Institute, as they are essentially his property The most notable of the other antiquities that were collected were given to the Boston Museum of Fine Arts " I owe to Dows Dunham, of the Boston Museum, an inventory of the Lowell material, with the bibliographical references for the few items that have been published The mummies do not appear to have survived

[81] W S. Smith, *Bull Boston Mus Fine Arts* 40 45–49, 1942

[82] Among the letters to Samuel George Morton in the library of the American Philosophical Society are two from Gliddon, one dated at Cairo, March 31, 1839, noting that more than a year has elapsed since his departure from Philadelphia, and the other dated from Alexandria, May 21, 1840, forwarding 143 skulls and mentioning that he was about to leave Egypt for America via France and England

[83] J P Lesley, "A Classified Catalogue of Antiquities, Collected by Mr Harris, and now in his Museum at Alexandria, Egypt, *Proc Am Phil. Soc* , 10 (1868), (80) 561–582, one of the most important items was the Harris papyrus, the annals of Rameses II, about 300 feet in length, sold to the British Museum in 1872

Among later visitors to Egypt who brought back antiquities was the naturalist Charles Pickering, curator of the National Institute at Washington, who studied the monuments and peoples of Egypt during 1843, and brought back some specimens of linen and mummy cloth and Egyptian papyri, which he gave to his uncle, John Pickering Fifteen years later, in 1858, Charles Pickering read before the American Oriental Society a report on the monuments of Tell el-Amarna, and nine years later he published an article on the above-mentioned Gliddon mummy-case (the fragment in the Smithsonian), striving to prove that it was the oldest piece of hieroglyphic writing known, antedating even the Third Dynasty

Dr. Henry Anderson, of New York, in Egypt in 1848, brought back a small collection including a mummy, an anthropoid mummy-case, and a wooden sarcophagus, as well as a chair and a table supposed to belong with them, these were publicly examined by an audience of a thousand at the Cooper Institute on Dec 15, 1864, with addresses by Dr. Anderson and his son J Ellery Anderson, and were then deposited in the New York Historical Society

The American Oriental Society gradually acquired a few Egyptian antiquities, beginning with the bequest of John Pickering in 1846, including the specimens brought home by Charles Pickering and also casts of the Rosetta stone and of "an Antique Stone with Egyptian figure and Greek inscriptions " Among other isolated gifts were a bronze image of Osiris 10½ inches high in 1855–56, a mummy skull from Sakkara and three scarabs in 1860–61, and a fragment of carved stone from Heliopolis in 1864–65.

But the most important of all these early American collections was that formed at Cairo between 1832 and 1852 by the English physician Henry Abbott, the secretary of the "Egyptian Society," brought to this country in 1852.[54] It had been catalogued in 1843 by Joseph Bonomi, and some of its prizes, such as the gold ring supposedly of Khufu, were described by Sir Gardner Wilkinson in that year, and by Lepsius and Prisse d'Avennes. Abbott appeared at a meeting of the New York Historical Society with the ring of Khufu in his pocket in November, 1852, and by January the entire exhibition was installed in the Stuyvesant Institute (659 Broadway), admission 50 cents. But efforts to sell the collection to such institutions as the Cooper Institute or Catlin's Indian Museum proved fruitless, and the high price of admission limited the number of visitors, so that within two years Abbott had lost $6000 and by 1855 had gone back to Cairo, leaving the collection behind. The exhibition was reopened at the Stuyvesant Institute as the "Egyptian Gallery" in January, 1856, with a reduced admission price of 25 cents. There it was visited by Professor C C Felton, of Harvard, who read a paper on the subject before the American Academy of Arts and Sciences in 1857 In view of efforts to sell it to the British Museum, a petition was circulated in December, 1858, advocating the purchase of the collection for some American institution, resulting in its acquisition by the New York Historical Society in 1860, the year after Abbott's death. Later was added a mummy sent to the United States by Dr Abbott shortly before his death Even though the two most famous pieces in the collection, the necklace and the pair of earrings inscribed with the name of Menes of the First Dynasty, have proved to be modern forgeries incorporating a few ancient beads, and even though the great gold signet ring of Khufu, found at Gizeh, has proved to be, not the actual ring of the builder of the Great Pyramid in the Fourth Dynasty, but the property of a priest of Isis of Khufu at a time of the revival of the cult of this king in the Twenty-sixth Dynasty, nevertheless the permanent installation of this famous collection in New York was the most important single advance in Egyptological work in this country before the last decade of the nineteenth century; at present it is exhibited in the Brooklyn Museum

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[54] On the history and contents of the Abbott collection, see Caroline Ransom Williams, "The Abbott Collection," *Quart. Bull. New York Hist. Soc* 1. 34–37, 91–102, 1917; 2· 14–21, 43–53, 75–88, 1918; 3. 1–7, 41–51, 71–81, 1919, 4; 91–99, 1920, 7. 3–9, 1923, and especially her general article, *ibid.*, 4· 8–14, 1920. Also Williams, *The New York Historical Society: Catalogue of Egyptian Antiquities (Numbers 1–160), Gold and Silver Jewelry and Related Objects*, New York, 1924 I am indebted to Mrs. Elizabeth Riefstahl, of the Brooklyn Museum, for the photographs of objects in the Abbott collection.

Among those who studied the Abbott collection while it was still at the Stuyvesant Institute was Edwin Smith, of Bridgeport, Conn , who in 1853 was able to read correctly a hitherto undeciphered name on a wooden stamp in the collection. After studying Egyptology in London and Paris, in the winter of 1857–58 he went to Egypt and continued to reside until 1876 at Luxor, where he formed a collection of antiquities, especially rich in papyri, the most important being the Edwin Smith medical papyrus acquired in 1862. When the Prince of Wales came to Egypt in 1868, Edwin Smith and the British vice consul descended a shaft 90 feet in depth and brought up thirty mummies in their coffins, from which the Prince selected the best for distribution among various institutions in England. But it was not until 1907 that Smith's own collection of antiquities came to this country, to be united with the Abbott collection in the New York Historical Society.

Another who studied the Abbott collection at the Stuyvesant Institute was Gustav Seyffarth, during twenty-four years as professor at Leipzig he had done his best to prevent acceptance of Champollion's method of decipherment, and now migrated to America in 1856 to spread his unorthodox ideas, or, as he put it, "because I am under obligation to protest against literary deceptions of the public " The prospectus of his lectures given at the Stuyvesant Institute in that year, issued under the patronage of President Charles King of Columbia College and of Librarian Joseph G Cogswell of the Astor Library, announced Seyffarth as the discoverer of the key to the hieroglyphics! In 1864 he read before the American Oriental Society a paper on "Manetho's Autograph in the Royal Museum at Turin," maintaining that the Turin Papyrus is the actual autograph manuscript of Manetho's history! Seyffarth, too, lectured as far west as St. Louis, where, as professor in Concordia College, most of his later work was published.

In 1858 the Philomathean Society of the University of Pennsylvania appointed a committee, consisting of Charles R Hale (later consul general at Cairo, 1864), S. Huntington Jones, and Henry Morton, to translate the Rosetta Stone The result was an elaborate lithographed volume with marginal decorations in Egyptian style, which appeared in two editions.

Individual travelers in Egypt continued to bring back miscellaneous material For instance, George A Stone, of Roxbury, Mass., in Egypt in 1858, obtained from Arabs who had rifled a tomb at Thebes the preceding year, a papyrus from a mummy, also "a gold spread-eagle taken from the same mummy-case" and "a scarabaeus of white stone found in the same tomb "

Thus, wrote J Peter Lesley with regard to Egyptian antiquities in 1868

> Americans are waking up to appreciate the charms of the new science of Archaeology, and unwonted interest has lately been manifested in pre-historic human remains, yet there are very few travelled Americans, even those who have a taste for such things, and read much about them, who know exactly what one should expect to find in such a collection, or what it is desirable to obtain for our new museums of archaeology on this side of the Atlantic [55]

NINETEENTH CENTURY WESTERN ASIATIC ARCHAEOLOGY

The year 1800 was a significant one for American relations with Western Asia, in that this was the year in which Commodore William Bainbridge, commanding the frigate *George Washington* and bearing the annual tribute to the Dey of Algiers, was forced by the latter to convey in turn the Algerian tribute to the Sultan of Turkey, thus bringing the American flag for the first time to Constantinople The first American consul to Turkey was appointed in 1802, William Stewart at Smyrna, but, since he was refused recognition by the Sublime Porte, he left shortly after his arrival in 1803, designating an English merchant as proconsul Similarly, in 1808, Sloane of Baltimore was sent to Smyrna as consul and, failing of recognition, delegated American affairs to the Danish consul During these first years of the century, however, American trade with Smyrna continued under the protection of the English Levant Company. The visit of an American ship to Smyrna in 1810, and the beginning of an American tour through Asia Minor in that year, including a visit to Ephesus, were described in the *Port Folio* Not until 1810 did American merchant ships reach Constantinople, the brig *Telemachus* of Salem, followed by the *America* and the *Calumet* of Boston In 1811 an American firm, Woodmas and Offley, opened an agency in Smyrna, David Offley also acted unofficially as American consul, though he was not formally so appointed until 1824 Captain Henry Harrison, of the ***Pennsylvania Packet***, advertised "filberts, nuts, and raisins from Smyrna for sale" at Philadelphia in 1812 The firm of J. & T H Perkins of Boston established an agency at Smyrna, shipping Turkish opium to Perkins and Co. at Canton and Smyrna figs to Boston. Ebenezer Parsons, of Boston, shipped coffee from Mocha on the Red Sea to Smyrna, circumnavigating Africa on the way William Gray, elected lieutenant-governor of Massachusetts in 1810, sent lumber and coffee to Algiers, then olive oil from Gallipoli to Russia, and duck and iron back to the United States The *Leander*, built in Salem in 1821 for Joseph Peabody, made numerous voyages to Asia Minor

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[55] *Proc Am. Philos. Soc.* 10 561, 1868.

It was in the course of such voyages that antiquities were sometimes brought back, or excursions made into areas where antiquities were to be seen Thus in January, 1817, Capt Henry Austin brought to New York "Antiquities from Asia," a pair of bricks with cuneiform writing (fig 2), one "taken from the mosque at the tomb of Daniel the Prophet, situated in the Desert, forty miles N W of Basra," and the other, "nearly thirteen inches square and three inches thick, from the ruins of ancient Babylon" These were deposited with Dr Samuel Latham Mitchill, of Long Island, and at the meeting of the American Philosophical Society on April 18, 1817, the original of our illustration (fig 2, "engrav'd by A Anderson for Henry Meigs esq") was "presented by Dr Meigs (Charles D)"[56] Likewise "one specimen may be seen at the Athenaeum in Boston," as John Pickering remarked in 1843

> This appears to be of the *sundried* kind, it was taken from the ancient ruins now called by antiquarians the Tower of Babel It was presented to the Athenaeum by Capt Henry Austin, who, I believe, took it from the ruins himself, he also gave another, as I have been informed, to some institution in New York Such instances of regard for the interests of learning in our country deserve the thanks of scholars

These were the first examples of cuneiform writing to reach this country In 1817 also, presumably, Samuel Hazard must have been at Smyrna, since a paper offered to the American Philosophical Society early in the following year was entitled "'Ther. Obs. on a voyage from Smyrna,' by Sam Hazard"[57] A visit to Smyrna and Ephesus before 1819 is described by a Bostonian[58]

In 1820 the United States sent Luther Bradish to Constantinople to negotiate a treaty, but the conversations were interrupted by the incipient Greek Revolution An investigation of the possibilities in 1823 by George B English (who had been in Mehemet Ali's service in Egypt) led to conversations between Turkish officials and Commodore John Rodgers in 1825, and in 1828 to the appointment of a commission composed of Captain William Crane and David Offley, consul at Smyrna, which failed to accomplish its purpose, so that new negotiations were undertaken by a commission composed of Captain James Biddle, David Offley, and Charles Rhind (one of the oldest American merchants trading in the Levant), resulting in the Turco-American treaty of 1830 Commodore David Porter was transferred from the consulate general at Algiers to Constantinople as our first diplomatic representative, with, however, merely the rank of Chargé d'Affaires, and the Legation was formally opened in 1831, with William B Hodgson, transferred from the consulate at Tunis, as secretary of legation. Porter served as Chargé for eight years (1831-39), and as Minister for four more (1839–43), and published two works on the city of his last years

In 1831, too, the American naval architect Henry Eckford, of Brooklyn (born in Scotland), was commissioned by the Sultan to take charge of the Turkish navy yard, and sailed in a corvette which he had built for the Sultan, commanded by Commodore George C De Kay, whose older brother, James Ellsworth De Kay, had married Eckford's daughter and accompanied the party Eckford died the next year at Constantinople, a book by J. E De Kay was the sole result of the mission

Meanwhile had begun the activity of the American missionaries in the Levant, starting with 1819, when Pliny Fisk and Levi Parsons were sent out from Boston to open the field in Palestine, and to survey the general possibilities of the Turkish Empire, at a time when this included the entire eastern horizon, Greece, Egypt, and Mesopotamia They reached Smyrna early in 1820, and Parsons died at Alexandria in 1822.

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[56] Cf. *Early Proceedings* 470 (April 18, 1817. "Donations from Dr Meigs"), bound in pamphlet vol. 453 of the Society's library

[57] *Early Proceedings*, 481 (May 1, 1818)

[58] *Letters from Asia, Written by a Gentleman of Boston to a Friend in that Place* (New York, 1819) Review in *Analectic Magazine*, 15 165–173, 1820

But before Fisk's death at Beirut in 1825, reinforcements had come to Syria, William Goodell and Isaac Bird in 1823, Jonas King in 1824 The first mission was planned to be at Jerusalem; but, though opened in 1823, this was abandoned in 1827 Beirut was found to be a more satisfactory center, and here a station was opened in 1825, Eli Smith arrived to assist in 1827. Elnathan Gridley and Josiah Brewer were established at Smyrna in 1826, to work with the Greeks and Jews, respectively, and the Smyrna station was formally opened in 1828 Brewer meanwhile had been transferred to Constantinople Even in these early years the missionaries pressed far afield Eli Smith and Harrison Gray Otis Dwight left Constantinople in 1830 to visit the eastern parts of the Turkish Empire, traveling as far as Persia and back in fifteen months Isaac Bird explored North Africa, with Tripoli and Tunis, and then resumed his work at Beirut Jonas King was transferred to Athens in 1830.

In 1831 began a new phase with the opening of official American relations at Constantinople The Beirut station was then reopened, and another was established at Constantinople, with William Goodell, followed in 1834 bv Harrison G O Dwight, Goodell went to Nicomedia in Bithynia in 1832, and in 1833 the Smyrna station was reopened, and the next year were established those at Brusa and Trebizond Justin Perkins, the "apostle of Persia," came in 1833 to work among the Nestorians of Persia, settling at Urumiah in 1835, and publishing a volume and some articles on his journeys, including "A Visit to the Ruins of Nineveh", he was at Nineveh on May 16 and at Nimrud on May 18, 1849, and remained in this area until 1869 Perkins was joined at Urumiah in 1835 by Dr. Asahel Grant (who regarded the Nestorians as the lost tribes of Israel), and by Fidelia Fiske and David Tappan Stoddard in 1843, and finally by A H Wright.

Forty-one missionaries had been sent out by the American Board by 1835, fifty-four more by 1844, one hundred and fifty-six more by 1861; but the mortality was nearly half, so that by 1861 there were only one hundred and twenty-five missionaries, located at twenty-four points, scattered through Syria, Persia, and Turkey proper. They not only broke the ground for the archaeologists, but they themselves made their territories and antiquities known to American readers. In his presidential address at the first annual meeting of the American Oriental Society, in 1843, John Pickering revealed how heavily the oriental scholarship of that day rested on the information supplied by the missionaries, especially in matters linguistic, topographical, and archaeological By 1853, declared Sir Austen Henry Layard in the British Parliament, there was no considerable place in all the Turkish Empire in which the influence of the American missionaries was not directly felt

Edward Robinson, the founder of Palestinian archaeology, primarily in the direction of scientific topography, dreamed from boyhood of visiting Palestine, as Schliemann dreamed of Troy He studied at Halle and Berlin between 1826 and 1830 After teaching Hebrew at the Andover Theological Seminary, and publishing a *Greek and English Lexicon of the New Testament* (1836), he was appointed professor of Biblical literature in the Union Theological Seminary in New York in 1837, and left immediately for three more years of study in Germany and Palestine He had found that the available material for his proposed treatise on Biblical geography was hopelessly inadequate or discrepant, and that personal examination was necessary At Beirut in 1838 he found a ready assistant in Eli Smith, now eleven years in the country, and in seven months of travel on horseback Robinson laid the foundations of our knowledge of Palestinian topography Thus in 1841, for a change, American *Biblical Researches in Palestine, Mount Sinai, and Arabia Petraea* was published simultaneously in England, Germany, and America Most of his identifications have stood the test of time As the result of a second journey in 1852, again accompanied by Eli Smith, he published *Later Biblical Researches in Palestine and the Adjacent Regions* in 1856, and his posthumous work, *Physical Geography of the Holy Land*, in 1865

The only other American topographical survey of importance in our period was that of Lieutenant W F Lynch, of the United States Navy, who explored the Dead Sea in 1848 and measured the depth of its depression below the Mediterranean

Another event of special importance in this decade was the foundation of the American Oriental Society, beginning with a meeting held in August, 1842, in the office of John Pickering in Boston; it was incorporated the next April, with John Pickering as president, and Edward Robinson as one of the vice-presidents. The *Journal* of the society, which began to appear in 1843, contains frequent references to Western Asiatic archaeological material. In the very first volume, for instance, apart from John Pickering's presidential address summarizing the then state of oriental studies, there appeared a paper by Edward E. Salisbury "On the Identification of the Signs of the Persian Cuneiform Alphabet," as well as a host of lesser items.

To continue with the activities of the missionaries, we note that Elias Riggs, previously stationed in Greece, was transferred to Smyrna in 1838. Here also came Henry John Van Lennep, born in that city (eight years before his father had sent the mummy to Boston), and educated in the United States, returning to Smyrna as a missionary in 1839. He remained in the East for thirty years (apart from two brief sojourns in this country), and traveled over Asia Minor and Greece before 1843, in Syria and Palestine in 1847, but his most notable contributions were his travels through the Hittite country in 1864, and his identification of the Pseudo-Sesostris relief and the Niobe of Mount Sipylus.

The mission in Syria, where Eli Smith remained until his death in 1857, continued to forward material. Henry A. De Forest sent a report of a tour of Mount Lebanon in 1849, as well as some bronzes fould on this occasion, presented to the American Oriental Society by his brother John W. De Forest, who lived in Beirut for several years and returned in 1856, to write books depicting life in Syria among the archaeologists, *missionaries, and consuls*. One of the most striking episodes was the discovery, in 1855, of the anthropoid sarcophagus of Eshmunazar II, King of Sidon in the fifth century B. C., with the first important Phoenician text coming from Phoenicia itself, thus giving rise to much research as to its interpretation and also the origin of the alphabet. While the sarcophagus was deposited in the Louvre by the Duc de Luynes, copies of the inscription were sent to America very promptly by the missionaries, including letters from H. A. De Forest and Eli Smith; squeezes were deposited in the Smithsonian, and articles appeared by Edward E. Salisbury, of New Haven, and William W. Turner, of Washington.

The Assyrian mission in Mesopotamia, located at Mosul, dates from 1850, when Dwight W. Marsh arrived and was joined the next year by William F. Williams, transferred from the Syrian mission. Henry Lobdell was soon added to the group at Mosul. Both Marsh and Lobdell sent home letters describing the archaeological discoveries. In Mesopotamia the excavations by Layard had just revealed a wealth of Assyrian sculpture. There is a story of a great man-headed winged bull which was offered to New York if its citizens could raise $300 for crating and transport; but there was so little interest in winged bulls that no money was subscribed, and the natives burned the sculpture for lime. It was in this direction that William F. Williams showed particular enterprise, applying to Rawlinson in 1852 for permission to send a few of the duplicate sculptures at Nimrud to America, the Smithsonian Institution at Washington being named as the recipient. The Trustees of the British Museum made no objection, so that a considerable number of slabs from Assur-nazirpal's palace were sent to the United States, and were distributed primarily along various centers of theological learning: Amherst, Andover (now in the Boston Museum), Auburn (now in the Metropolitan Museum), Bowdoin, Dartmouth, Union, Vermont, Williams, and Yale, and with one, retained by Rev. William F. Williams himself, I lived for a year in the house of his son, Talcott Williams. In 1855 a dozen additional slabs were purchased by Henry Stevens and sent to America, where they were acquired by James Lenox, and in 1859 passed into the New York Historical Society collections. The missionaries also sent cuneiform tablets to Yale, Amherst, Williams, Union, and Dartmouth Colleges; others from Nineveh were sent by Dwight Marsh to the American Oriental Society and to a private collection in St. Louis, the last of which was assumed by Seyffarth in 1857 to be perhaps the only cuneiform brick in the country—though we have seen that others had arrived forty years earlier. Also to the cabinet of the American Oriental Society came two little gems, one of them an amethyst with an Assyrian lion, and two seal cylinders, one of red jasper and the other chalcedony, given by Henry Lobdell in 1855–56; and a scarab and a bronze figure of Astarte 2½ inches high from Mosul were given by William F. Williams, in 1862.

Mention should be made, also, of the American educational institutions in the Near East as centers of learning. Cyrus Hamlin established the College at Bebek, Constantinople, in 1840; and this was succeeded by Robert College in 1863. Both Robert College and the Syrian Protestant College of Beirut were incorporated in 1864, at the very end of our period.

NINETEENTH CENTURY. AEGEAN ARCHAEOLOGY

In connection with the Aegean, Minoan, or Helladic civilization, it may be recalled that several of the early American visitors, particularly those of naval or diplomatic status, examined prehistoric sites and their surface remains Thus the schoolmaster of the *Constitution*, George Jones, visited the plain of Troy in 1826, Mycenae and Tiryns in 1827 Commodore David Porter, while Chargé at Constantinople, likewise visited Troy; and General Lewis Cass, American Minister to France, wrote about Crete

It is of interest also to recall the meteoric visit of the actual discoverer of this civilization, Heinrich Schliemann, to this country in 1851, as recorded in his diary just published by the American School at Athens[59] He arrived in New York on February 15, 1851, and thirteen days later departed for the West, he returned on May 18, 1852, and left the next day for Europe But this, of course, was before Schliemann had actually begun to dig, and before he had become acquainted with the actual appearance of the prehistoric artifacts of Greece So the fact that he missed, by a few months, the arrival of the first-known object of Aegean art in this country is of little significance, he would not have recognized it if he had seen it The object in question, however, is of considerable interest a vase (fig 23) in the Abbott collection of Egyptian antiquities, apparently actually found in lower Egypt, an importation from Crete at about 1500 B C[60] An almost exact counterpart was excavated at Pseira in Crete in 1907 and is now in the Candia Museum, and there is always the possibility that the Abbott vase itself was found in Crete and reached Egypt in modern times,[61] like the Ithacan jewelry discussed above.

Another pioneer American connection with the Aegean age was the presence of Frank Calvert, English by birth, as American vice consul at the Dardanelles; he owned the east half of the hill of Hissarlik, which he was convinced was ancient Troy, while his brother Fred Calvert dwelt at Thymbria about two hours farther south, and was equally convinced that his was the Trojan site Frank Calvert's site had already yielded a considerable collection of Trojan antiquities before Schliemann arrived in 1870; and Schliemann, after probing indiscriminately everywhere, eventually found Troy under Frank Calvert's farm

Still another American contact with the Aegean age began with the transfer of William J Stillman from the consulate at Rome to that of Canea in Crete in 1865, the terminal year of our study His effort to excavate at Cnossos, therefore, lies outside the range of our survey And later still were his unfortunate controversies with Schliemann and Dorpfeld as to the so-called Byzantine and Celtic origins of the palace at Tiryns and the Mycenaean beehive tombs

The same terminal date marks the opening of another archaeological career associated with a civilization which must be regarded as an offshoot of the Aegean, namely, that of Cyprus. For it was in 1865, too, that Luigi Palma di Cesnola received his appointment as United States Consul to Cyprus, and then began the excavations which resulted in the accumulation of the largest collection of Cypriote antiquities in the world, subsequently the nucleus of the collection of antiquities in the Metropolitan Museum of Art in New York

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Such, in rapid review, were some of the early American activities in the Mediterranean field As yet the great museums of art in this country had not come into being, American projects of excavation were quite unknown, and there were no schools or institutes of archaeology But these developments lay not very far in the future In a single year, 1870, three great museums were incorporated, the Museum of Fine Arts in Boston, the Metropolitan Museum of Art in New York, and the Corcoran Art Gallery in Washington The centennial year 1876 marked a great artistic awakening, not only in Philadelphia, but throughout the whole country

It was not until 1879 that Charles Eliot Norton proposed the foundation of the Archaeological Institute of America, with its center, for the time being, at Boston At that very moment two young American architectural students,

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[59] Shirley H Weber, *Schliemann's First Visit to America 1850–1851* (Cambridge, Mass., 1942) There seems to be a discrepancy in the title of this work, which is given as one year too early for the diary

[60] Edith Hall Dohan, "A Late Minoan Vase from Crete in the Abbott Collection," *Quart Bull New York Hist Soc* 12: 127–133, 1929 Mrs. Dohan gives the date of the acquisition in lower Egypt as 1860, but this is rather the date of the purchase by the Historical Society, and as the vase is listed in the Abbott catalogue of 1853 (no. 77), it must have been acquired before 1852, though probably later than 1843 since it is not listed in the older catalogue

[61] Williams, *Catalogue of Egyptian Antiquities, Gold and Silver Jewelry:* 148, n. 4

Francis H Bacon and Joseph Thatcher Clarke, abandoning a cherished plan of descending the Mississippi on a raft, decided instead to purchase a sailboat in England and to search for the origin of the Doric order. Sailing up the Rhine and down the Danube, they had arrived at the ruined Greek city of Assos, south of Troy, and were proposing its excavation. Norton, at the first Institute meeting held in 1879, with his classical preferences, suggested that this project be taken up as the first official work of the new Institute

> Mr Francis Parkman, who was the next speaker, said that he had supposed that the main purpose of the Society would be to promote the study of American Archaeology That little had yet been done by Americans in this work and that every year would make such study more difficult by removing the old marks Mr Perkins said that he did not wish to detract from American Archaeology, but that many persons were interested in this branch and work in it would come naturally, here we can get what there is to be had without difficulty when the proper time comes for it, that now he felt we ought to turn to the other side, where we read every day of foreign governments taking out and carrying off works of art . Mr Parkman said that the object of the Society, as he understood it, was the acquisition of knowledge and not the acquisition of objects or works of art, the very fact that the Eastern Hemisphere is being so fully explored makes it our duty to undertake work here in America . . Mr Parker said that it was a very interesting question, but that he felt Mr Perkin's position to be the true one. If knowledge was the true aim of the Society, then this knowledge should be useful and not simply curious, and the knowledge which was useful to us was not that of barbarians but that of cultivated races which had preceded us. The Indians were low in the scale of civilization Mr. Parkman's own books showed us this, and if we possessed all the pottery-ware, kitchen utensils, and tomahawks which they had made, it would be no better for us.[*]

The presidency of the new Institute was first offered to Francis Parkman In the Institute files is a reply written to Norton by Parkman, saying in part.

> Unluckily for me, I am hardly in a position to undertake it, having been visited, for the past two or three months, by a return of my old trouble in the head so severe as to disable me from doing work I have already on hand, and therefore putting any new responsibilities out of the question. The president of the new association might do a great deal towards building it up and giving it a distinguished future—in fact, its success or failure would largely depend on him—and he ought to be one not only willing but able to take the laboring oar

By this letter, the main direction of the Institute's activity was definitely determined Norton was elected as the first president, and under him, Assos was excavated, the American School of Classical Studies at Athens was founded in 1881, the American School at Rome (now part of the Academy) in 1894, the American School at Jerusalem in 1900, impressive outposts for American investigation in the Mediterranean

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[*] MS minutes of the Archaeological Institute.

EARLY AMERICAN PAINTERS IN ENGLAND

A. HYATT MAYOR

Metropolitan Museum of Art, New York City

(*Read November 20, 1942*)

SINCE the collapse of the school of Paris some years before the fall of France, the painters of the United States have been thrown on their own resources more than they were for a couple of generations One result has been some talk about what constitutes an American style An American style has of course existed for a long time and has had its effect, well recognized at the moment, on the painting of the Western world

The origins of painting in the United States contribute to an understanding of the essentially American note in our painting today, since the discoveries of our ancestors survive as our assumptions As an instance of survival, it has been pointed out that the type of the Puritan house—a detached house built not very far from other similar houses—survives in essence in all our suburban homes It is therefore not untimely to glance at the first paintings brought to this country and the first American painters who made an impression abroad

Latin America started a century or more ahead of North America to make contact with European art, to print and illustrate books, to found universities, write histories, and study aboriginal languages As early as 1525 Cortez brought with him a painter, whose work still exists in Mexico City, but North America waited two more centuries for its first visit from a painter with a sound European training This occurred when Dean Berkeley settled in Newport in 1729 with a small entourage which he had constituted as a kind of society for promoting useful knowledge among the Indians The first great intellectual to visit North America, he brought an educational establishment which included a library, a gallery of paintings, and a living painter Such a humane program of higher education had to wait for two centuries before becoming a part of an existing university Berkeley's artist was John Smibert, who eventually settled down in Boston with a collection of copies after Poussin, Titian, Raphael, and Vandyck, which he had painted in Italy After Smibert's death these copies hung for many years in his Boston painting room as all-important models for native artists Charles Willson Peale studied them in 1765, and twelve years later Trumbull wrote that he had found them "very useful, especially a copy from Vandyck's celebrated head of Cardinal Bentivoglio" (fig 1) Copley, who constantly refers to them in his letters, used them to such advantage that when he sent his *Boy with a Squirrel* (fig 2) from Boston to London in 1765, Sir Joshua Reynolds said, "The man who painted that picture studied Vandyck" This must be the first time the European art world noticed a work of art made in America by a white American

Whatever we today might think of Smibert's copies, they were the best available transmitters of a great tradition of form Our early painters studied them as eagerly as Mantegna and his fellows studied the Roman marbles that transmitted the tradition of Greek sculpture to Renaissance Italy

The first return wave of art from the New World to the Old did not come from the conservative, authoritarian colonies of Latin America but from the headquarters of Quaker initiative Late eighteenth-century Philadelphia resembled a European city more than any American city before or since Even as late as 1798, Latrobe, coming from London, wrote. "I could see no difference between Philadelphian and English manners The same style of living, the same opinions as to fashions, tastes, comforts and accomplishments" There is no doubt that Dr Johnson would have felt less exiled there than in Edinburgh The city took its culture most wholeheartedly from England at the moment when it was pulling away politically—or was it the most English trait of all to conform in manners while dissenting in opinions? This deeply English background helped Benjamin West to make so great a career in England that he left a deeper impression on European art than Sargent and Whistler

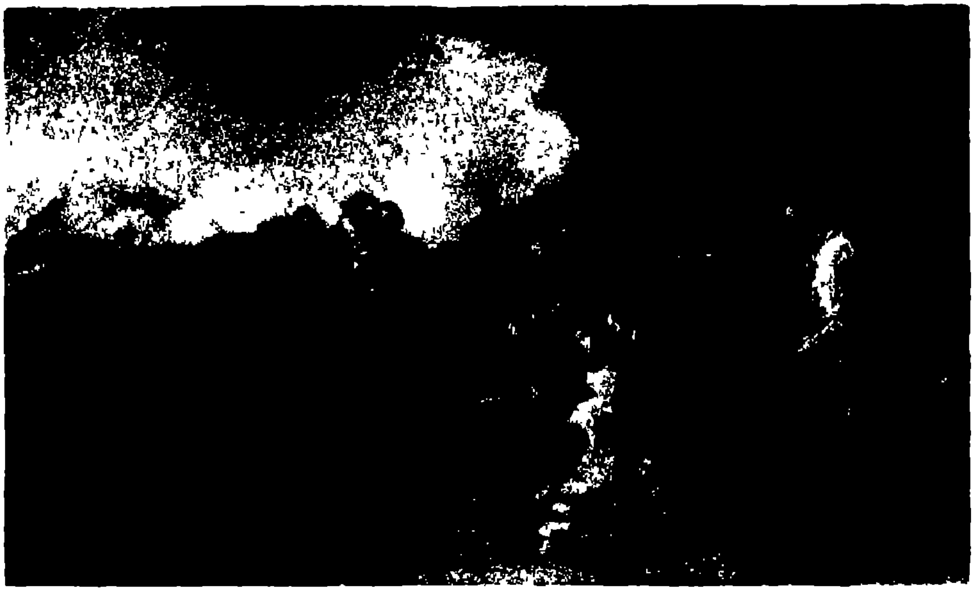

FIG. 3 West The Death of General Wolfe, 1771 Kensington Palace, London.

FIG. 4 Gros The Battle of Eylau, painted 1808 Collection of Madame René Antonin, Toulouse

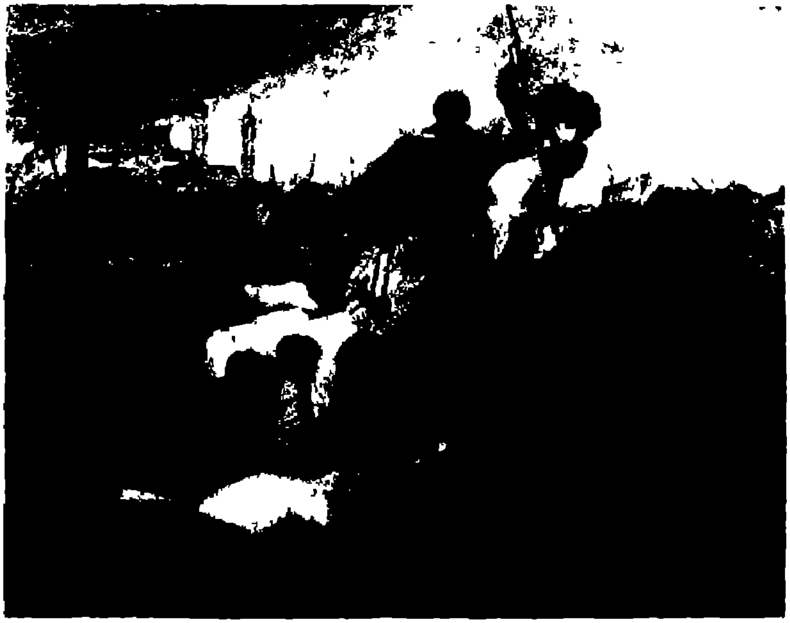

FIG. 5 Copley Sketch for Watson and the Shark, 1778 Metropolitan Museum of Art

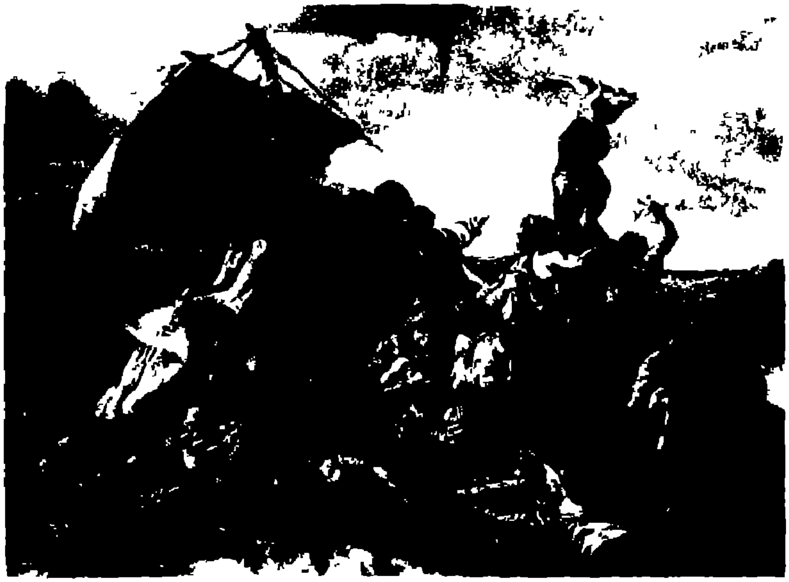

FIG. 6 Gericault Sketch for the Raft of the Medusa, 1817–1819 Metropolitan Museum of Art

FIG. 7. Copley The Death of Major Pierson, painted 1783 Tate Gallery, London.

FIG. 8 David The Distribution of the Eagles, painted 1810 Versailles.

West may not have realized the importance of his discovery of the dramatic potentialities of everyday clothes, for he did little to exploit it beyond painting the group of the American commissioners at the peace negotiations of 1783, in which he went as far as one could in giving a plain record of an important diplomatic transaction This boldly brushed-in beginning shows that many of West's paintings would be masterpieces had he not slicked them into tameness In his sketch of Franklin making contact with the genius of electricity, he dared to pose the Doctor in his everyday suit, with a swirl of raincloak to accomodate him a little to the high style of allegory, but William Franklin, who was twenty-three when he flew the kite to protect his father from the possible sniggering of the neighbors, appears as the routine grand-manner putto Though West's Yankee shrewdness had hit on the sharp note of perception that distinguishes American painting at its best, he was too much of a politician to persist in artistic reform once novelty had lost its value as advertisement He was the last person to need a Sir Joshua to point out "the danger which every attempt at innovation necessarily incurred of repulse or ridicule"

West's success in England must have been a strong factor in luring almost every American painter of his time to study or make a career in London They did not go to Germany, as they did in the mid-nineteenth century, for the great German romantic school was barely started Nor could American artists easily go to Paris, because France was upset much of the time by the French Revolution and the Napoleonic wars, and because the French art world was barred to outsiders by family connections and vested rights almost as impenetrable as those of the *ancien régime* itself London, on the other hand, was made easy by West, who taught, housed, fed, and got commissions for every American painter who came there, from Pratt, Copley, and Trumbull to Morse West could afford to be kind to what he knew to be his less gifted brethren From the 1760's until his death in 1820 the Americans who gathered around him made a powerful minority lobby in British art In 1787 a London newspaper noted. "Mr West paints for the Court, and Mr Copley for the City Thus the artists of America are fostered in England." In 1813 Morse wrote home "The American character stands high in this country as to the production of artists. Mr West now stands at the head, Mr Copley next, then Colonel Trumbull."

Like the Italian artists that Francis I imported to Fontainebleau, these Americans in exile painted differently from the way they had painted at home Their historical pictures, almost all of which originated under West's guidance, had little connection with work that was being done in America, though they foreshadowed the great French paintings that broke the way for the nineteenth century As has already been said, West's *Death of Wolfe* (fig 3) was engraved a generation before Gros's Napoleonic battles (fig 4), which so closely resemble it in spirit Copley's *Watson and the Shark* (fig 5) came thirty years before Géricault's *Raft of the Medusa* (fig 6), perhaps the first real triumph of romantic painting Copley's *Death of the Earl of Chatham* (1779–1780) may well have been in David's mind when he painted another parliamentary hubbub in his *Serment du Jeu de Paume* of 1791 Copley's *Death of Major Pierson* of 1783 (fig 7) has a movement of flags and soldiers that is remarkably like the movement, in the reverse direction, of David's *Distribution of the Eagles* of 1810 (fig 8) These would not be David's first borrowings from England, as Edgar Wind has recently shown These English-made paintings were all known in France through engravings What Sir Charles Holmes said of Copley applies equally well to West and Trumbull, that had he "been French, he would have been famous as the forerunner of the Romantic Movement"

It is characteristic of Copley that all his historical paintings should glorify Englishmen, for he fled from Boston to London in order to satisfy his deep desire for all that England had to offer He was a Tory, not from snobbery or comfort, but from inescapable instinct He longed to study famous works of art, to work for the cognoscenti, to associate with the ablest painters of his day, and to expand as an artist in a world of wealth and harmony West and Trumbull, on the other hand, made no secret of being just as deeply in sympathy with the United States They championed their cause by painting American subjects such as *Franklin and the Lightning*, *The American Peace Commission of 1783*, *The Battle of Bunker Hill*, *The Declaration of Independence*, *The Surrender of Cornwallis*, and so forth Most of these paintings were conceived in England and not at home They are the work of exiles whose political faith has been fanned into zeal by hostile criticism Foreign travel, that makes

FIG 9 Trumbull The Battle of Bunker Hill, painted 1786 Yale University Art Gallery, New Haven

every man aware of his nationality, does so doubly if it takes him among people who have good reason to dislike his government, for he cannot know how much he may love his country until he feels called upon to defend it

Luckily Jefferson had momentarily acquiesced in the artistic faith of West's group in 1787 when he was getting Houdon to make the statue of George Washington Jefferson wrote to Washington "I am happy to find that the modern dress for your statue would meet your approbation I found it strongly the sentiment of West, Copley and Trumbull in London I think a modern in an antique dress as just an object of ridicule as a Hercules or Marius with a periwig and a chapeau bras" But Jefferson, our most intellectual adherent of the rationalism that produced the French *Encyclopedia*, was at heart a classicist Thirty years later his real taste came out when he was getting Canova to carve the statue of Washington and wrote "as to the style of costume, I am sure the artist and every person of taste in Europe would be for the Roman Our boots and regimentals have a very puny effect"

Not only Jefferson but the whole of America became blind to the monumental possibilities of contemporary clothes, leaving French artists to exploit what Baudelaire called the dignity of pants and a plug hat In 1841, when Greenough carved George Washington as a half-nude Jove enthroned, the nudity caused an outcry Jefferson himself would probably have been shocked, if it is true that he could not bear to keep the nudity of Houdon's *Frileuse* around Monticello The nudity of Greenough's Washington does not disconcert us today as much as the toga, which was accepted at the time When the stirring age of the Revolution receded into the past, Americans began to feel that their plain unvarnished tale could no longer command the world's attention unless it borrowed grandeur from Rome Greenough, Reynolds, and the Archbishop of Canterbury, in wishing to drape togas on the recent dead, were reversing the mediaeval practice of picturing Herod or Julius Caesar in tights and jerkin Both ages were valuing symbol above historic fact

The early nineteenth century had not forgotten West's innovation, but had reapplied it.

As the world settled down after Napoleon's wars, it wanted detailed pictures, not of relatively tame current politics, but of the most recent age of glamor. In France in the 1830's Raffet began the vast series of lithographs of Napoleon's campaigns which did so much to create the legend on which Napoleon III rode to power. In Germany in 1840 Menzel followed suit with his hundreds of illustrations of Frederick the Great that popularized Prussian autocracy and so helped Bismarck to unify Germany under Prussian command. In the United States in 1850–1852 Lossing's *Pictorial Field Book of the Revolution* was in the same vein and helped to start various societies for preserving historic landmarks. Historical painting occurs when a country is able to see itself in a dramatic light.

What really killed the painting of contemporary history was the spread of the technique of wood engraving. A burin can engrave the end grain of boxwood with finer detail and more quickly than the old knife could cut the plank, and the resulting end-grain block can be locked in the same form with type to print a practically unlimited number of inexpensive impressions. The result was that every eye got a flood of pictures such as the world had never seen. Contemporary events suddenly became familiar to the world at large, and almost immediately, through the *Illustrated London News* (founded in 1842) and its imitators, such as *L'Illustration* (1843) and *Harper's Weekly* (1857). Sated by the weekly glut of news pictures, crowds would no longer pay a shilling a head to see a canvas of some great recent event as they had done in the day of West and Copley. Wood engravings had killed the novelty of the latest battle or heroic death long before the painter could get to work on his canvas.

When outstanding mid-nineteenth-century painters became involved in some historic crisis, they either did not paint it at all, or else, like Manet in the Franco-Prussian War or Winslow Homer in the Civil War, they reported only the minor incidents which passed under their eyes. They left to professional pictorial reporters the task of drawing, usually from verbal descriptions, the battles, assassinations, and treaties that artists rarely witness. Homer's Civil War pictures are intimate glimpses, like Walt Whitman's *Specimen Days*, but Homer never stood back and took a far view of his time as Whitman did in *When Lilacs Last in the Dooryard Bloomed*. Manet took a far view when he looked abroad for his few historical paintings of *The Execution of Maximilian* and *The Battle between the Alabama and the Kearsarge*, and so produced some of the last, and perhaps the most brilliant, works of the genre initiated by Benjamin West.

RAFINESQUE'S PUBLICATIONS FROM THE STANDPOINT OF WORLD BOTANY

E. D. MERRILL

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(*Read November 20, 1942*)

IN undertaking work on a major task of actually preparing a comprehensive "Index Rafinesquianus," I recently had occasion to make a critical examination of all of that most erratic botanist's numerous botanical publications. At the same time I examined a great many papers by various authors commenting on diverse phases of Rafinesque's work. One statement by Professor M. L. Fernald[1] impressed me, and it was his comment that suggested to me the topic discussed in this paper. He had occasion to consider the status of certain eastern North American species named and described by Rafinesque, and states "Constantine Samuel Rafinesque [Schmaltz], the most erratic student of the higher plants, has made unending trouble for American and (although they apparently do not realize it) European botanists." In another paper on Rafinesque[2] I mentioned Fernald's statement and amplified it by calling attention to the fact that, in his papers published while he was a resident of Palermo, between 1806 and 1815, and especially in his later publications, chiefly those issued in Philadelphia in the decade between 1830 and 1840, Rafinesque originated myriads of problems not only for the students of the flora of Europe to solve, but also for those concerned with a study of the floras of Mexico and Central America, the West Indies, South America, Japan, Siberia, China, India, Central Asia, Asia Minor, Malaysia, Australia, and North, Central, and South Africa. There is scarcely a major floristic area in the world that Rafinesque's work does not touch. His erratic work, in the past largely associated with North American botany, because much of his productive career was spent in the United States, and much of his work was published here, far from raising merely problems of concern to botanists working on the North American flora, actually impinges on world botany to a remarkable degree.

This short paper is not intended to be a summary of Rafinesque's life and work. Briefly he was born in Galata, a suburb of Constantinople, in 1783 and passed his youth in Turkey, Livorno, Marseilles, Pisa, and Genoa. His father was a French merchant, and his mother, née Schmaltz, was of German parentage, born in Greece. He was largely self-educated, never having attended a university. From 1802 to 1805 he lived in Philadelphia, and from 1806 to 1815 in Palermo, Sicily. He returned to the United States in 1815, spending the remaining years of his life in this country. His second voyage to the United States ended in a catastrophe. After a long trip of 100 days, the ship, the *Union of Malta*, on which he was a passenger was wrecked on Race Rocks, near Fisher's Island in Long Island Sound, on November 2, 1815. In this shipwreck Rafinesque states that he lost his fortune, his share of the ship's cargo, all of his natural history collections assembled in the preceding twenty years, his library, unpublished manuscripts, drawings, and even his clothes. He remained in New York for several years and in 1818 made his first trip to Kentucky, returning to Philadelphia late in that year. In May, 1819, he left Philadelphia for Lexington, Kentucky, where from that year until 1826 he taught in Transylvania University. He returned to Philadelphia in September, 1826, and with the exception of various exploring expeditions to some of the Eastern States, he resided in that city until his death, September 18, 1840. At the time of his death he was in very straightened circumstances, and his body was buried by some of his friends in Ronaldson's cemetery in that city. The grave was not permanently marked until 1919. His effects were disposed of at auction to meet the demands of his creditors. When Ronaldson's cemetery was abandoned as a cemetery and turned into a city park, Rafinesque's remains were disinterred and removed to Transylvania College, Lexington, Kentucky, in March, 1924. The centenary of his death was celebrated by special ceremonies at Transylvania College in October, 1940.

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[1] Fernald, M. L. Some genera and species of Rafinesque. *Rhodora* 34: 21–28, 1932.

[2] Merrill, E. D. A generally overlooked Rafinesque paper. *Proc. Am. Philos. Soc.* 86 (1): 72–90, 1942.

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I cannot refrain from quoting a few passages from G Browne Goode's[3] review of Richard E Call's *Life and Writings of Constantine Samuel Rafinesque* Goode states that Rafinesque was

> a man whose brilliant intellect, eccentric character and unhappy fate will always cause his career to be looked upon with interest, and whose nervous and appalling industry has been the cause of a myriad of perplexities to students of the nomenclature of plants and animals in Europe as well as in America
> The roving habit of mind which soon became a part of his nature led him into a mental vagabondage that influenced his career even more than the lack of a permanent place of abode His precocious mind, unguided and undisciplined, wandered at will over the entire field of books and nature, and by the time he had reached the age of nineteen he had formed his own character and equipped himself for the career which lay before him Lacking guidance, however, he was by no means fitted to enter upon a scientific career in a country like the United States, so when he crossed the Atlantic [first in 1802, and again in 1815] he brought with him the germs of failure and bitter disappointment His fatal tendency to 'scatter' was already apparent, and in the work which he did for the 'Specchio' [during his residence in Palermo] all the weaknesses of his subsequent career were foreshadowed

My adventures in Rafinesquiana commenced in the early part of 1942, when I discovered by chance that in a paper published by Rafinesque[4] in France in 1834 there were no less than 46 new generic names and binomials, for the most part validly published, that had entirely escaped the attention of the compilers of our standard indices The oversight is scarcely surprising, for the reason that all of these new names are undifferentiated in the text covering Rafinesque's cursory remarks regarding de Candolle's interpretations of certain North American genera and species Where he differed from de Candolle on problems of nomenclature, he proposed new names in a most casual manner, quite as he did in his earlier reviews of the work of his contemporaries who were then publishing on the flora of North America, including Michaux, Nuttall, Barton, Bigelow, Muhlenberg, Eaton, Torrey, Elliott, and Pursh, besides drawing certain conclusions as to the work of Loudon, Lindley, Sowerby, Hooker, and others It is fortunate, for those who must concern themselves with bibliographical matters in listing new names, that Rafinesque's innovation in publishing many scores of new generic and specific names in his reviews of the work of other authors was not followed by his successors Perhaps influenced by Rafinesque's procedure, the unwritten law that reviews should not be made the media for publishing new names became universally established over a century ago Rafinesque's overlooked paper of 1834 is listed in the Royal Society's *Catalogue of Scientific Papers* (5 76, 1871), but I have elsewhere seen no references to it, it is not mentioned in Fitzpatrick's[5] comprehensive bibliography of Rafinesque, which contains 940 numbered items

In the course of my examination of Rafinesque's publications it soon became manifest that various other important papers of this author had not been indexed I was aware of the fact that this applied to the rather extensive and very rare ***Autikon Botanikon*** (1840), which was printed in Philadelphia in the year of Rafinesque's death Here, because no copy was available, the new generic names were not listed in ***Index Kewensis*** until its seventh supplement appeared in 1929 The entries for 83 new generic names were made from Pennell's[6] paper the several hundred new binomials that appear in the ***Autikon Botanikon*** are still unlisted Incidentally, a modern lithoprint facsimile edition of this rare work has recently been issued under the auspices of the Arnold Arboretum, and it is now generally available for the first time, since most of the limited original edition was apparently destroyed in Philadelphia after Rafinesque's death There is reason to believe, from Rafinesque's own statement regarding certain other volumes published shortly before 1840, that only 160 copies of this work were printed At any rate, only about a dozen copies of the ***Autikon Botanikon*** are known to be extant, it apparently being much more rare in European libraries than it is in those of the United States I was not fully prepared to discover that various other complete volumes and pamphlets published by Rafinesque had been overlooked by the compilers of our standard indices, and that overlooked, obscurely published new names in papers that had been indexed were fairly numerous.

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[3] *Science*, n s , 1: 384-387, 1895

[4] Rafinesque, C S Remarques botaniques sur quelques plantes de l'Amérique Septentrionale, dans les quatre premiers volumes du *Prodromus* ou *Synopsis plantarum* de de Candolle *Act Soc Linn Bordeaux* 6 261 269, 1834 See Merrill, E D , A generally overlooked Rafinesque paper *Proc. Am Philos Soc* 86 (1) 72-90, 1942

[5] Fitzpatrick, T J *Rafinesque* A *sketch of his life with bibliography* Des Moines 1 241, 32 pl , 1911

[6] Pennell, F W "Unrecorded" genera of Rafinesque *Bull Torr Bot Club* 48 (3) 89-96, 1921

Having direct access to all but very few of Rafinesque's known botanical papers and books, I completed the record by securing the essential data from other sources in the United States and England. With a complete set of published data available, as far as Rafinesque's actual publications are known, I then undertook the time-consuming task of indexing all of Rafinesque's new names in the botanical field. The normal procedure was to transfer to large index slips all that Rafinesque published about each entity, whether it were a new genus, subgenus, species, or variety, or merely a substitute name. The total number of these slips is between 10,000 and 12,000. While this study has not progressed to a point where I can make even an approximate estimate of the total number of new names proposed by Rafinesque in all categories, he did originate a total of about 3,000 new generic and subgeneric names. The expectation is that there are between 1,200 and 1,500 Rafinesque plant names, in all categories, that have been entirely overlooked by botanists in that they do not appear in any of our standard indices. After a lapse of a century it seems to be desirable that these generic and specific names (for the most part validly published) be at least listed.

When the slips were sorted by major groups, such as algae, fungi, lichens, mosses, pteridophytes, and phanerogams, it became possible to initiate preliminary work on the preparation of the actual lists. That for the pteridophytes has been completed and checked. Of the 62 new names published by Rafinesque in this group, it was found that most of them had been overlooked. Within the field covered by Christensen's *Index Filicum* and its three supplements, there are actually 54 Rafinesque names, but of these Christensen detected only 8, and the entries to half of these are not to the original places of publication. In the algae about 60 new generic names were proposed, in the fungi about 55, and in the lichens 3. Apparently most of the names in these last three major groups have been overlooked. The number of new generic and specific names for the phanerogams is very much larger.

Lest some reader of this statement be fearful that the mere listing of the Rafinesque names overlooked for more than a century will unduly upset nomenclature, let me hasten to record that for the pteridophytes as a group only one Rafinesque generic name and one binomial stand. The former is *Pteretis* Raf. (1818), which should replace *Struthiopteris* Willd. (1809) (non Weis., 1770, nec Bernh., 1801), *Matteuccia* Todaro (1866), and *Pterinoides* O. Kuntze (1891), while the latter is *Equisetum praealtum* Raf., and various botanists have long since accepted both. I do not think that many nomenclatural changes will result through listing the very much larger number of names for the phanerogams. Most of the necessary changes in reference to binomials will be through the application of the homonym rule, and the percentage here will be small.[7] Where Rafinesque's properly published generic names antedate those of other authors currently accepted for the same group (and there will be a number of these), it is always possible to invoke the principle of *nomina generica conservanda*.

The chief reason for listing the multitudinous overlooked Rafinesque names is, of course, the homonym rule. It is suspected that the majority of botanists would be perfectly willing to outlaw all of Rafinesque's publications were it possible to do so, but as a considerable number of his generic names and binomials have always been accepted, and many more should have been accepted, it is difficult to see how his papers could be outlawed without abandoning his universally accepted names. Throughout Rafinesque's publishing career he proposed and described genera and species that were not only acceptable to his contemporaries, but also to his successors, and these names are everywhere used. The following generic names proposed by Rafinesque illustrate this point: *Distichlis*, *Eatonia*, *Stenophyllus*, *Peltandra*, *Clintonia*, *Protanthera*, *Hexalectris*, *Nestronia*, *Ofaiston*, *Phyllipedium*, *Adlumia*, *Polanisia*, *Nemopanthes*, *Cladrastis*, *Nirwamia*, *Pachystima*, *Didiplis*, *Osmorhiza*, *Spermolepis*, *Ptilimnium*, *Cymopterus*, *Meriolix*, *Oreoxis*, *Lomatium*, *Oxypolis*, *Steironema*, *Synallodia*, *Stylisma*, *Ilysanthes*, *Endopogon*, *Blephilia*, *Lepachys*, *Erechtites*, *Serenia*, and *Agoseris*.

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[7] I realize very fully that some of the conservative botanists will echo "Why bring that up?" at the mere suggestion that Rafinesque's numerous names, overlooked for more than a century, be now listed. Yet a nice species of *Trillium* has been named in honor of one of these botanists, because in 1906, when *Trillium declinatum* (A. Gray) Gleason was published, its author did not know that in 1840 Rafinesque had described an entirely different *Trillium declinatum* Raf. from Alabama and Florida. Rafinesque's binomial is not listed in *Index Kewensis*. Thus we now have *Trillium Gleasonii* Fernald replacing *T. declinatum* Gleason 1906, non Rafinesque 1840. If an argument is needed to support the listing of Rafinesque's overlooked names, here it is.

As expressed by Fernald,[8] "The task of sifting the comparatively few perfectly sound grains from the chaff and the distorted or unrecognizable grains is a thankless one and, above all, it should be undertaken only by those with intimate knowledge of the floras concerned." What this sifting process means may be illustrated by the statement that, including the above Rafinesque generic names and about 75 others that have been eliminated through the application of the principle of *nomina generica conservanda*, the number that modern botanists might accept, *on the basis of strict priority, is actually less than five percent, of the total that Rafinesque proposed.* Contrast the work of Linnaeus, where about 99 percent of the names that he adopted are still accepted. The discrepancy here is not due to the "weight of authority" but is an excellent index to Linnaeus' good judgment as opposed to the erratic judgment of Rafinesque. Some idea of the percentage of Rafinesque's proposed generic names that can be definitely placed, either as valid entities or as synonyms, is indicated by the fact that De Dalle Torre and Harms (*Gen. Siphonogam.* 583–586, 1906) listed only 11 of Rafinesque's genera under their heading *genera incertae sedis*, that is, those that have not been referred to their proper families. The actual number of Rafinesque's genera that cannot be definitely placed will probably prove to be considerably larger than this, but some of these 11 can probably be placed on the basis of future investigations. While Rafinesque's record of valid or possibly valid genera is exceedingly poor, the record of his attempts to delimit species on the basis of actual specimens is scarcely better. I cite three cases. In *Clintonia* he described 18 species, in *Dodecatheon* 15, and in *Trillium* 35. Modern botanists, working on the floras of the same geographical regions whence Rafinesque's specimens came, have been able to recognize but 2 species of *Clintonia*, 1 of *Dodecatheon*, and 20 of *Trillium;* and not a single Rafinesquian binomial in these three genera has been adopted by his successors.

There are numerous cases where Rafinesque's proposed and validly published generic names actually antedate those in current use, but many of these have been included in the list of rejected names, for other names published later by various authors have been included in the list of *nomina generica conservanda* approved by the International Botanical Congresses. Examples of these are *Bulbilis* Raf. (1819), replaced by *Buchloe* Engelm. (1859), *Diarina* Raf. (1808), replaced by *Diarrhena* Beauv. (1812), *Spathyema* Raf. (1808), replaced by *Symplocarpus* Salisb. (1818), *Megotigea* Raf. (1836) [1837], replaced by *Halicodiceros* Schott (1853), *Hexalepis* Raf. (1836) [1838], replaced by *Vriesea* Lindl. (1843), *Pogomesia* Raf. (1836) [1837], replaced by *Tinantia* Scheidw. (1839), *Piaropus* Raf. (1836) [1837], replaced by *Eichhornia* Kunth (1843), *Chrosperma* Raf. (1825), replaced by *Amianthium* A. Gray (1837), *Pubilaria* Raf. (1836) [1837], replaced by *Simethis* Kunth (1843), *Amblostima* Raf. and *Oxytria* Raf. (1836) [1837], replaced by *Schoenolirion* Durand (1855), *Laoethoe* Raf. (1836) [1837], replaced by *Chlorogalum* Kunth (1843), *Geboscon* Raf. (1824) and *Periloba* Raf. (1836) [1837], replaced by *Nothoscordium* Kunth (1843), *Quamasia* Raf. (1818) and *Cyanotris* Raf. (1818), replaced by *Camassia* Lindl. (1832), *Diphryllum* Raf. (1808), replaced by *Listera* R. Br. (1813), and *Cordula* Raf. (1836) [1838], replaced by *Paphiopedilum* Pfitz. (1886). I have here covered only the monocotyledonous families, but there are approximately 55 additional cases in the dicotyledonous groups or a total of about 75 cases where earlier and validly published Rafinesque generic names have been officially eliminated in favor of later ones published by other authors. The list must eventually be considerably increased if we are to avoid nomenclatural changes due to the discovery of still other generic names published by Rafinesque at dates earlier than those of other authors now currently accepted.

This is a rather deplorable record in view of the generally accepted principle of priority in taxonomy. While our rules of nomenclature are impersonal, yet it seems to be evident that modern botanists are just as unimpressed with the character of Rafinesque's work as were his contemporaries, and his contemporaries merely ignored much of his work under the assumption that it was not necessary to consider his findings. After all, the blame rests very largely with Rafinesque because of his usually inadequate methods of presentation, brief and sketchy descriptions, and his habit of publishing in out-of-the-way places. Numerous shorter papers were published in some ten different American magazines, twelve European and British ones, and in no less than seven "personal" periodicals that he hopefully initiated from time to time, but most of which never attained more than volume one, number one, and few saw the completion of more than one, or at most two volumes Rafinesque's tendency to scatter his shorter papers in strange places is discussed somewhat in detail in a previous paper,[8] where the titles of ten American serials and twelve European ones, that he favored by submission of manuscripts to their editors, are listed Most of these are not in any sense of the word botanical periodicals The period covered is from 1803 to 1841 Most of these periodicals are not normally found in the libraries of even the largest botanical institutions in this country or abroad

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[8] *Rhodora* 34: 21, 1932.

This problem of inaccessibility applies not only to the types of periodicals in which Rafinesque published numerous technical papers, but also to his small, independently published pamphlets and to his larger books In two cases I have been able to locate only single copies in all of our libraries, and curiously, although one of them, the *Herbarium Rafinesquianum*, was actually published in Philadelphia in 1833, there seems to be no copy of it in any of the Philadelphia libraries The *Western Minerva* was published in Lexington, Kentucky, in 1821, and of this only a single copy, in the library of the Academy of Natural Sciences of Philadelphia, is known to exist Regarding it Rafinesque states that he was able to save but three copies, as the irate printer destroyed the entire stock In his *Life of Travels* (p 66, 1836), Rafinesque states that this action was due to his secret enemies, but the probability is that he was unable to pay the printing bill Yet it is understandable that some of his associates in Lexington, Kentucky, might have been disturbed by some of the articles included in this, the rarest of his publications He wrote a letter to Bory St Vincent which he actually published in his *Western Minerva* (1 71-74, 1821), printed in the town where he was then residing and which was then known as "The Athens of the West" He refers to certain of his fellow townsmen as follows

> A set of unfortunate Individuals, who have two eyes, but cannot see their minds are deprived of the sense of perception they are astonished and amazed at my discoveries, are inclined to put them in doubt and even to scoff at them Our cat-fishes, eels, shads, sturgeons, &c are for them mere fish to fill their stomach! and moreover they are all of European breed, and were carried here by Noah's flood direct from the Thames, the Seine and the Rhine!—I let them rail to their heart's content, and I laugh at them It is only in Europe that my labors and discoveries may be fully appreciated here I am like *Bacon* and *Galileo*, somewhat ahead of my age and my neighbors The Western Minerva has been threatened before her birth

All of which may well have had at least a shadow of truth, but which, nevertheless, was an evidence of lack of tact on the part of Rafinesque, considering the time and place.

Throughout Rafinesque's copious writings one notes this tendency to criticism, and the reiteration of claims that he (Rafinesque) was always right and that those who differed from him were wrong This attitude, combined with his strange ideas regarding classification and nomenclature, and his unorthodox methods of publication, went far in alienating his contemporaries who were working in similar fields He was obsessed with the idea of discovering new genera and new species, and the establishment of these actually became a monomania This, however, is no place in which to discuss the idiosyncracies of such a remarkable character as Rafinesque

Even Rafinesque's larger publications, such as his *Medical Flora* (1828-1830), *New Flora and Botany of North America*, four volumes (1836-1838), *Flora Telluriana*, four volumes (1836-1838), *Sylva Telluriana* (1838), the *Good Book or Amenities of Nature* (1840), and the *Autikon Botanikon* (1840), are exceedingly rare, and copies are unobtainable today The reasons for their scarcity are the time and place of publication (Philadelphia, 1828-1840), the fact that they were for the most part privately published by Rafinesque, their very limited sale, the limited editions (apparently about 160 copies only, this being definitely the case with the *Flora Telluriana*), and the fact that when Rafinesque died in 1840 his effects were sold at auction to satisfy the demands of his creditors Apparently the unsold stock of his numerous publications was disposed of as waste paper.

Attention should be called to the fact that the various volumes mentioned above were essentially media in which Rafinesque published his findings in reference to the classification and nomenclature of plants Thus his *New Flora and Botany of North America* is not a descriptive flora in any sense of the word, but consists largely of additions that Rafinesque made to the subject, most of the items included being proposals of new genera and new species. The same is true regarding his *Flora Telluriana* and his *Sylva Telluri-*

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[8] *Proc. Am Philos. Soc* 86 (1) 78, 1942

ana—neither in any sense treats the genera and species of the world, but chiefly those forms that Rafinesque considered to represent new genera and new species. The same statement applies to his *Alsographia Americana*, the *Good Book or Amenities of Nature*, and the *Autikon Botanikon*. As four of these works apply to the world at large, rather than merely to the flora of the Eastern United States, they should have a place in every large botanical library, particularly libraries of institutions wherein systematic work is an important activity.

The net result of Rafinesque's long-continued publication methods is that even in most of our larger botanical libraries many of his publications are missing, and as this is true of the specialized American libraries, it is even more so in regard to those of Europe. With us there are excellent collections of Rafinesquiana at the Gray Herbarium, the Arnold Arboretum, the New York Botanical Garden, the Academy of Natural Sciences of Philadelphia, the Smithsonian Institution, and the Library of Congress. I judge that from a botanical standpoint the magnificent assemblage at the Arnold Arboretum is by far the most complete, and yet this lacks several Rafinesque items. It is suspected that the paucity of Rafinesque publications in European libraries is reflected by the fact that in the second edition of his *Thesaurus* (1872) Pritzel listed only four Rafinesque titles, although in the first edition (1851) he included sixteen, most of which he apparently never saw.

Naturally, with his fixed ideas that species and genera were constantly being formed, and that both genera and species should be established on the basis of very slight differences, Rafinesque proposed and named very numerous entities as genera, subgenera, species, and varieties. That more of his generic and specific concepts have not been accepted is more a reflection on his judgment than on the judgment of his contemporaries and successors. As noted above, the total number of new generic and subgeneric names actually published by Rafinesque approximates 3,000, thus placing him in a category by himself in the number of these units that he thought should be recognized. I know of no author who proposed so many generic names, for even Linnaeus, taking up numerous names originated by his predecessors, recognized less than 1,600. The very fact that among these 3,000 Rafinesquian generic names only about 25 are currently accepted as valid, while about 75 others have been placed in the list of *nomina generica rejicienda* is in itself another reflection on Rafinesque's judgment, for in segregating genera good judgment is basically most important. Probably Adanson (*Familles des plantes* 2: 1–640, 1763) originated more new generic names than any single botanist since Linnaeus, with the exception of Rafinesque, or at least he is credited with having originated them. As a matter of fact, the total that he recognized is approximately the same number that Linnaeus recognized, somewhere in the neighborhood of 1,600. Most of these were adopted from such pre-Linnaean authors as Hippocrates, Theophrastus, Pliny, Dioscorides, Avicennia, Pontedera, Dillenius, Vaillant, Tournefort, Heister, Fuchs, Loefling, Ray, Plukenet, Plumier, Lobelius, Micheli, Dodoens, Camerarius, Gronovius, Hermann, Gesner, Ruppius, Celsius, Brunfels, Buxbaum, Cordus, Ammann, P. Browne, Houstoun, Kaempfer, Rheede, and Rumphius, together with a certain number that Linnaeus originated. In the index to his work Adanson actually credits to himself the authorship of less than 200 of the names he published, although currently his name is cited as the authority for many more than 200, because he first assigned to many earlier names an approximation of generic form. Rafinesque occupies the unique position of having originated infinitely more new generic names than any other botanist in the entire history of the science, and yet at the same time one whose proposals have met with the smallest percentage of acceptance, for the possible acceptance of less than five percent of approximately 3,000 new names speaks for itself, and yet uninformed individuals have, at times, spoken of Rafinesque as a "great" botanist. Clearly it takes more than the mere publication of many hundreds of papers and many thousands of new generic names and binomials to deserve the characterization "great." The average botanist's work is not judged so much by his immediate associates and co-workers as it is by posterity, and posterity has been particularly hard, although scarcely unfair, in its judgment of the nature of Rafinesque's work. Rafinesque's confidence in his own judgment was no less than superb, and he claims, in various of his writings, that posterity would justify his attempts at clarification of classification of both plants and animals. Unfortunately for Rafinesque, posterity was and still is as unimpressed as were his contemporaries.

While Rafinesque described a great many new genera and new species *de novo* on the basis of actual specimens, he based an extraordinarily large number of his "new" entities on the published work of other authors. It is apparent that if, in scanning a published description or illustration, he noted the slightest discrepancy between the characters as given by this or that author, and his or other botanists' concept of the same genus or species, he proposed a new generic or specific name (or both) on the basis of the description before him, and the noted "differences" might well be due to the personal equation, rather than any actual differences He apparently disbelieved in the unusually wide geographical distribution of individual species, and I judge that many of his units were proposed, named, and described because he could not accept, in general, the idea that any species could be of very wide geographical range

He proposed his own laws of nomenclature,[10] and many of the changes in both generic and specific names were made because of his confidence in his own rules—rules that other botanists never accepted If a generic name was too short, he lengthened it, as *Leea* Linn. = *Leeania* Raf , *Inga* Willd = *Ingaria* Raf., *Cola* Schott = *Colaria* Raf , *Neea* Ruiz and Pav = *Neeania* Raf , *Rhus* Linn. = *Sumachium* Raf , *Zea* Linn. = *Mayzea* Raf , *Poa* Linn. = *Poagris* Raf , *Chloris* Sw = *Chlorostis* Raf , *Donia* R Br = *Doniana* Raf , and *Crypta* Nutt = *Cryptina* Raf , *Cryptella* Raf , and *Cryptaria* Raf (these three new names actually published in a single line!) If names were too long, or as he said, uncouth in sound, these were also changed, such as *Tabernaemontana* Linn = *Tabernaria* Raf , *Lightfootia* L'Hér. = *Lifutia* Raf , *Calamagrostis* Roth = *Amagris* Raf , *Stachytarpheta* Vahl = *Turpheta* Raf , *Carludovica* Ruiz and Pav = *Ludovica* Raf , and *Krasheninnikofia* Gueldst = *Kranikofa* Raf. (1814), *Kranikovia* Raf (1837), and *Krasnikovia* Raf (1837) Names that he designated as "mongrel," part Latin and part Greek, he changed at will, for this reason abandoning *Vincetoxicum* Linn in favor of *Gonolobus* Michx , and changing *Scyphofilix* Thouars , to *Scyphopteris* Raf , while for such a name as *Pteris* Linn., which he correctly says merely means fern, he at various times proposed no less than five substitutes—*Peripteris* Raf , *Pterilis* Raf , *Lemapteris* Raf., *Phyllitis* Raf , and *Pteridium* Raf. He was just as casual in his treatment of specific names proposed by other authors when, for any reason, he considered that they did not apply, and he changed a great many of them at will A good, illustration is his treatment of *Floerkea proserpinacoides* Willd (*Am Jour Sci* 1 373–376, 1819) "a long and uncouth specific name which has been changed by every subsequent author." He then proceeded to list *F uliginosa* Muhl , *F lacustris* Pers , and *Nectris pinnata* Pursh as representing the same species, and although expressing a preference for Muhlenberg's name, he most casually proposed three others "Did I think myself permitted to coin a new name, while so many have been proposed already, I should have called it either *F tenella*, or *F flaccida*, or *F olitoria*" Regarding names, he states (*Fl Tellur* 1 16–17, 1836 [1837]) "I am never at a loss for names, as Linnaeus was when he framed *Quisqualis*, I could readily supply 20,000, *all good*", he literally spawned new names! As an extreme example of the most casual manner in which Rafinesque proposed new names, I cite the following case from his *Sylva Telluriana* (p 85, 1838).

> 500 CARPUPICA *Raf probably another distinct G* Type *C odorata* Raf Piper carpupija R P tree of Peru with fragrant leaves—Piper methysticum and Churumaya are also probably types of other Genera ? to be called *Methysticum esculentum* Raf and *Churumaya arborea* Raf Is not Piper betel another ? to be called *Betela mastica* Raf ?

All these new names are readily placeable in synonymy, for Rafinesque actually designated the type of his genus *Carpupica*, and lists the binomials on which *Methysticum*, *Churumaya*, and *Betela* are based, none of these can be considered as validly published

While I have above indicated that Rafinesque's very numerous nomenclatural innovations have received short shrift at the hands of his contemporaries and successors, in that only about 25 of his new genera have been more or less generally accepted, and that about 75 of his names that were actually earlier than currently used ones published by other botanists have been placed in the list of *nomina generica rejicienda*, still there are a number of additional cases that need to be treated on their merits I cite only a very few to illustrate this point *Shortia* Raf was published in 1840, and *Shortia* Torr. and Gray was published in 1842 Technically the latter should be replaced by *Schizocodon* Sieb and Zucc. (1843) or *Sherwoodia* House (1907) It is suspected that when this case is brought before a properly constituted international body, *Shortia* Torr and Gray (1842) will be retained, because *S galacifolia* Torr and Gray is a name now rather widely used in horticulture, *Shortia* Raf (1840) is a synonym of *Arabis* Linn The case of *Delonix* Raf is in a different category Under all rules this is the proper generic designation for the now universally distributed tropical tree known as the flamboyant, flame tree, fire tree, or royal Poinciana. While *Delonix* Raf has been adopted by a considerable number of botanists, it is curious to note how consistently the conservative botanists still continue to designate the species as *Poinciana regia* Bojer, the binomial under which it was originally described, but the type of the genus *Poinciana* is *P pulcherrima* Linn = *Caesalpinia pulcherrima* (Linn) Sw , Bojer did not describe his entity as a new genus, but erroneously placed it in the Linnaean genus where it does not belong This very characteristic and striking species should be known as *Delonix regia* (Boj) Raf *Hebokia* Raf (*Alsogr Am.* 147, 1838) is an older name than *Euscaphis* Sieb and Zucc (1840) and is validly published, it was based wholly on *Sambucus japonica* Thunb = *Euscaphis japonica* (Thunb) Kanitz To avoid a change in the generally accepted name for this particular genus, it will be necessary to conserve the later name by appropriate action, but as yet no one has proposed such action.

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[10] Rafinesque, C S. Principes fondamentaux de somiologie ou les loix de la nomenclature et de la classification de l'empire organique ou des animaux et des végétaux. Palerme 1–51, 1814 Also *Flora Telluriana* 1: 81–90, 1836 [1837] (Philadelphia)

I hold no brief for the acceptance of *Rytilix* Raf for the characteristic grass genus currently known as *Hackelochloa* O Kuntze, all that Rafinesque says (Seringe, *Bull Bot* · 219, 1830) is "III *Rytilix* (Rafin. in litt) *Manisuris granularis* et *myurus* auct 1. *R glandulosa* (Rafin mss.)" *Manisuris granularis* Linn f. and *M myurus* Linn are not congeneric, the former being a species of *Hackelochloa* and the latter a species of *Rottboellia* Had O Kuntze known of this most sketchy "publication" of *Rytilix* Raf , he might have accepted it instead of proposing the new name *Hackelochloa* in 1891, and yet there is no way of determining on which of the two cited synonyms *Rytilix glandulosa* Raf was based except by arbitrary selection *Cenchrus granularis* Linn. = *Manisuris granularis* Linn f = *Rytilix granularis* Skeels = *Hackelochloa granularis* O Kuntze, *M myurus* Linn = *Peltophorus myurus* Beauv = *Rottboellia myurus* Benth. I personally consider that Rafinesque's publication is invalid, in that he gave no generic description and based his new generic name on binomials only Clearly in this case the action of the International Congress in conserving *Hackelochloa* O Kuntze (1891) over *Rytilix* Raf (1830) was correct.

It is not anticipated that any botanist will agree with Rafinesque in his extreme views as to the limits of genera and species, although some of our modern botanists both in Europe and in America seem to approximate his viewpoint, if we may judge by the very tenuous characters by which some specialists now differentiate both genera and species It seems to be evident that the present tendency in systematics is to subdivide the larger and more or less complex genera, although it is inconceivable that any individual will go to the extremes that characterized Rafinesque's work This point is brought up merely to emphasize the fact that if a modern botanist decides to subdivide a large and complex genus, it may not be necessary for him to originate new generic names for certain segregated groups In many cases it is evident that some of Rafinesque's published names will serve, for whatever else he did, he usually indicated the type It is thus usually possible to interpret his proposed genera and subgenera, especially when his new names were based on bibliographical references As these numerous Rafinesque names were for the most part validly published, no reason exists for not accepting those that can definitely be placed

I list here a part of the genera that Rafinesque subdivided, in order to bring to the attention of those botanists, who may be inclined to subdivide these groups, the fact that in some cases Rafinesque may have forestalled them and that he may have proposed a name, or names, for a group or groups, that they now feel to be worthy of generic status Among the genera that Rafinesque subdivided are *Acacia*, *Acer*, *Achyranthes*, *Aesculus*, *Agrostis*, *Albizzia*, *Allium*, *Amaryllis*, *Andropogon*, *Ardisia*, *Aristida*, *Aristolochia*, *Arum*, *Aspalathus*, *Aster*, *Atropa*, *Avena*, *Baeckea*, *Bauhinia*, *Bignonia*, *Bumelia*, *Camellia*, *Campanula*, *Capparis*, *Carex*, *Casearia*, *Cassia*, *Cissus*, *Cistus*, *Cleome*, *Commelina*, *Convolvulus*, *Conyza*, *Cordia*, *Cornus*, *Crotalaria*, *Croton*, *Cuphea*, *Cuscuta*, *Cyperus*, *Cypripedium*, *Cytisus*, *Daphne*, *Dendrobium*, *Dianthera*, *Drosera*, *Echium*, *Ehretia*, *Elaeocarpus*, *Epidendrum*, *Eugenia*, *Euphorbia*, *Festuca*, *Ficus*, *Fraxinus*, *Gentiana*, *Gerardia*, *Geum*, *Gossypium*, *Gypsophila*, *Habenaria*, *Helianthemum*, *Helicteres*, *Heliotropium*, *Hicoria*, *Hy-*

pericum, *Ilex*, *Inula*, *Ipomoea*, *Jussiaea*, *Justicia*, *Lantana*, *Laurus*, *Leersia*, *Leucas*, *Litsea*, *Loranthus*, *Lycium*, *Lythrum*, *Melastoma* (including *Miconia* and other genera), *Mimosa*, *Myrica*, *Myrtus*, *Neottia*, *Nicotiana*, *Origanum*, *Ornithogalum*, *Osbeckia*, *Pancratium*, *Panicum*, *Passiflora*, *Peperomia*, *Phyllanthus*, *Phlomis*, *Physalis*, *Piper*, *Poa*, *Polygala*, *Polygonum*, *Pontederia*, *Populus*, *Quercus*, *Reseda*, *Rhamnus*, *Rhexia*, *Rhus*, *Rubus*, *Ruellia*, *Salix*, *Salvia*, *Sambucus*, *Saxifraga*, *Scabiosa*, *Scilla*, *Scirpus*, *Scleria*, *Sideroxylon*, *Smilax*, *Solidago*, *Spiraea*, *Sterculia*, *Stipa*, *Teucrium*, *Tilia*, *Tradescantia*, *Uniola*, *Urtica*, *Utricularia*, *Veronica*, *Viburnum*, *Vitis*, and *Xyris*

As an extreme case in generic segregations, Rafinesque's treatment of the large genus *Carex* may be cited In his paper, published in 1840,[11] he recognized 22 genera as segregates from *Carex*, of which 19 were briefly defined as new, and under these 22 generic names he published about 130 new binomials Few of these generic and specific names, to my knowledge, have ever been cited in botanical literature since they were published, and none of them, or the numerous other new names that appear in the *Good Book*, are listed in *Index Kewensis* Apparently even modern facsimile reprinting of rare publications is no guarantee that the often numerous new names that appeared in the original will thus be included in current indices Clearly, if one were tempted to follow Rafinesque's example and segregate various genera from *Carex* Linnaeus, as currently understood, one would here find names already published for at least certain groups

As one scans monographic treatises issued within the past century, wherein some of these numerous genera are considered, one rarely notes a Rafinesque name that has been accepted, even for minor categories such as subgenera or sections The usual procedure in such groups as *Quercus*, *Aristolochia*, *Carex*, *Croton*, *Gentiana*, *Melastoma*, *Polygonum*, *Ficus*, *Piper*, *Phyllanthus*, and other large genera has been to propose names for secondary groups *de novo*, when, in some cases, it would have been perfectly feasible to have accepted names previously proposed by Rafinesque (as genera), utilizing these as designations of minor categories As Rafinesque's publications frequently antedate those of certain monographers, this would have been a perfectly logical course to pursue It is refreshing to note that within the past decade at least one botanist has had the courage of his convictions and has utilized certain Rafinesquian generic names, such as *Pythiusa* Raf , *Tulocarpa* Raf., and *Murtekias* Raf , as the designations of sections and subgenera[12]

In spite of Rafinesque's often erratic work, I am inclined to dissent from the type of "argument" discussed below In the long article on "Conservation of Later Homonyms" (*Kew Bull* 409, 1935, sub *Claderia* Hook f), this name (1890) is retained in preference to the much earlier *Claderia* Raf (1838), on this basis "Rafinesque's genus, though technically published, must apparently be synonymous with *Melia* L , *Azadirachta* Juss (1830) or *Murraya* L , and it represents a kind of pseudo-scientific work, the nomenclatural results of which may well be legislated out of existence " The general approval of such a principle would open a veritable Pandora's box, for in systematic botany who shall define the limits of "pseudo-scientific" work? Very little reason exists for retaining *Claderia* Hook f if a better argument than the above cannot be devised, it was Hooker's error in selecting a generic name that had already been used for an entirely different group, and in retaining it we merely condone his error Here is a case where the weight of authority intervenes, for Hooker's botanical work was on a plane so infinitely higher than was that of Rafinesque that the two can scarcely be compared, were the situation reversed, there is no chance that Rafinesque would have received corresponding consideration

While in no respect should this contribution be considered as an argument in support of Rafinesque's general type of work, it is hoped that its publication will bring to the attention of other than American botanists the desirability of at least considering Rafinesque's generic entities when monographic work is undertaken, or when local floras are under consideration Had the botanists of the world in the past had the opportunity of becoming acquainted with the scope of Rafinesque's publications, I might not have had to cite the rather unflattering figure of 75 of his generic names that have been officially placed in the limbo of *nomina generica rejicienda*, largely because his contemporaries and successors in Europe were unfamiliar with what Rafinesque had already proposed, and thus redescribed the same groups under different names at later dates This is, in a way, a reflection on the bibliographical researches of various botanists whose later generic names have been officially accepted in order to avoid undue changes in currently accepted binomials through a strict application of the rule of priority It is clear that the vast majority of Rafinesque's published generic names can be definitely placed, but to do this individual authors need to have access to his publications When one of his names is found to be valid, there is really little excuse for coining a new one to designate the same natural group, one that in order to stand the test of time must, perhaps, be approved at some future session of the International Botanical Congress From a purely bibliographical standpoint Rafinesque's botanical publications are distinctly worthy of careful consideration, no matter how much his work may be criticized, and his work is, on the whole, eminently worthy of severe criticism It is to be regretted, in justice to him, that the necessity of considering what he proposed was not realized at an earlier date Asa Gray[11] recognized this in the year following Rafinesque's death, for in 1841 he stated "Many of Rafinesque's names should have been adopted, some as a matter of courtesy, and others in accordance with strict rule" A century later about the best we can do, when it is discovered that a Rafinesque generic name antedates a currently accepted one proposed by some other author, in ignorance of what Rafinesque published, is promptly to add the Rafinesque name to the already over-long list of *nomina generica rejicienda* This, in Asa Gray's words, is neither courteous nor in accord with strict rule We who follow the cult of Flora, in times of old worshipped by the Romans, might at least recall the words of Ovid· "Pascitur in vivis livor Post fata quiescit, cum suus ex merito quemque tuetur honos"

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[11] Rafinesque, C S. The natural family of Carexides *Good Book* 23–28, 1840 A facsimile reproduction of this paper was issued under the auspices of the *American Midland Naturalist* in 1913 At the same time another overlooked paper that was published in the *Good Book* was reissued, this being Rafinesque's "Scadiography of 100 Genera of Ombelliferous Plants, chiefly New, with their Types &c " (*Good Book* 49–61, 1840, facsimile reprint 1913).

[12] Prokhanov, J *Conspectus systematicus Tithymalorum Asiae Mediae* (Trans. Rubber and Guttapercha Institute.) Moscow 1–241, 70 fig , 46 maps, 1933

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[11] *Am Jour Sci* 40 234, 1841

16 FEB 1949

SYMPOSIUM
on
POST-WAR PROBLEMS

Papers read before
The American Philosophical Society
Midwinter Meeting
February 19–20, 1943

PHILADELPHIA
THE AMERICAN PHILOSOPHICAL SOCIETY
INDEPENDENCE SQUARE
1943

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CONTENTS

America Enters the Scene 121
Guy Stanton Ford, President Emeritus of the University of Minnesota

Social and Economic Implications of Freedom from Want of Food 126
Frank G. Boudreau, Milbank Memorial Fund

Problems of Post-War International Monetary Stabilization 133
John H. Williams, Harvard University and Federal Reserve Bank in New York.

Some Thoughts on Post-War Planning 139
His Excellency **Alexander Loudon**, The Ambassador of the Netherlands

Money and Sovereignty 147
Robert B. Warren, Institute for Advanced Study

The Small Nations in the Post-War World 152
Halvdan Koht, Norwegian *Minister of Foreign Affairs*, 1935–1941

Individual, Family, Population, and Race 161
Franz Boas, Columbia University

Some Implications of Population Change for Post-War Europe 165
Frank W. Notestein, Office of Population Research, Princeton University

Panama Canal Revenues and Finances 175
Emory R. Johnson, University of Pennsylvania

The Economics of Transition 189
Alexander Loveday, Director, Economic and Financial and
Transit Department of the League of Nations

The Problem of Self-Determinism 194
Oskar Halecki, Director, Polish Institute of Arts and Sciences in America

16 FEB 1949

AMERICA ENTERS THE SCENE

GUY STANTON FORD

President Emeritus of the University of Minnesota

THE inalienable irresponsibilities of a public speaker justify me in not taking too seriously any topic I was compelled by the program committee to announce some months ago I am not one of the happy few who think they hold the keys of human conduct under all the circumstances prevailing in a dynamic and changing world If the world picture changes, one must adjust to a different world outlook before he considers where he or his country, in this case America, enters the scene The picture has changed from what it was a few months ago. The progress of the war effort in America and on the battlefields has also forced to the front the necessity of giving realistic consideration to the problems of our national morale when we face the shock of peace. Will it be with a unified front or will we be riddled by factions, group interests, and the confusions of fifth columnists in which our peacemakers fire on each other? Under any interpretation of my topic these questions bring public affairs and public policy to the rostrum of a society dedicated by its charter to the advancement and diffusion of science and learning in America

In thus raising questions about the strength and weakness of our nation to carry or to funk its pending and seemingly inescapable responsibilities in a world order nearer to our hearts' desire, I am not, I am sure, departing far from the central thought of every individual member of the American Philosophical Society. I have not done what any good historian should have done, that is, look up the records of the society and its membership in past crises, I have assumed that a society that has had presidents of the United States and public men of consequence and profound thinkers on man's destiny and America's future in its membership has never been alien and aloof in the times that try men's souls Such times are now our living moment. No one can deny the implications of this present for an unborn future. No one who faces that future, no one who is not a fugitive from reality, but must feel called upon to strip himself of outworn partisanships, group and individual self-interest, and narrow conceptions of national interest Half-truths and simple slogans are no answer to the issues that the coming peace will raise It is not enough to measure with gratification how a free country bears the burden of war We will grumble, but we will make the sacrifices incident to total war Will we as willingly make the sacrifices demanded by a total peace? When we are called on to implement the Atlantic Charter and the Four Freedoms, will we leave them as melancholy monuments of high moments much as we and our allies left Mr Wilson's Fourteen Points? The exigent question we cannot escape is how we, a free people, will bear the burden of freedom.

If now we seek an answer or answers to these questions, they can be only a compound, unstable if you choose, between the presently prevailing national mood and long-accepted national attitudes. No one can now say definitely what equilibrium of forces old and new will determine America's course in a post-war world One can make only approximations.

The first forecast that we may venture to make is that the return to the ostrichlike isolation that dominated the country after the last war is clearly unthinkable and unacceptable to even the man in the street, the man in Main Street. And he is more important than anyone on any other street. The representatives he chooses do not often rise above him in breadth of view, but they hear his voice and by and large they rebroadcast his views, sometimes shrewd and sound, sometimes short-sighted and willfully deaf to wiser counsels. This time it is clear that when the time comes to reckon the cost of another world war in blood and treasure and tears, it will be political suicide for any party or any outstanding public man to flaunt openly the grim, unwilling decision that the United States has a stake in shaping and sustaining international institutions that promise security against international lawbreakers. There must be an end to the aggression of politically infantile peoples led by paranoiacs who would dominate the lives of others by aggressions that grow out of their own and their peoples' sense of inferiority and insecurity We came nearer an equivalent decision twenty-five years ago than most realize An analysis of the votes in the Senate on the question of our entrance into the League of Nations shows that there was available the necessary majority on the basic question of our adherence to it The main question was lost amid the confusions of partisanship and personalities A whole nation misread its history. We have never been unaffected by what goes on in the rest of the world We are a nation peopled by migrants from Europe because of what went on there Time and again our course has been shaped by threats to our interests from policies or actions of European nations We were not often deeply stirred because, whether we acknowledged it or not, the British navy was our first and sufficient line of defense in the Atlantic Yet after the last war an ocean in which submarines had sunk vessels off our shores and over which the wings of airplanes were soon to beat a path to our doors seemed still to the great mass of Americans, whether in the Middle West or the East, the Far West or the South, as broad as when their ancestors sailed it for months to find a haven in this remote continent We, their children, were once more done with Europe and mildly contemptuous of the Pacific nations who protested the gratuitously irritating terms of our immigration laws We ignored the growing power of Japan while its far-reaching plans encompassed our outlying possessions and traversed our long-established interests and policies on the Pacific littoral The treachery of the weeks that preceded Pearl Harbor, and was revealed by it, swept the scalés from the eyes of the blindest isolationist It will not be for us to remember Pearl Harbor, but rather for the Japanese and their allies to record it as the greatest Pyrrhic victory ever won The fall of France, the drama at Dunkerque, the battle of London, the horrors of Poland, the trampling of helpless little peoples in the cities and plains of Holland and Belgium, in Czecho-Slovakia and in the valleys and fjords of Norway, were illumined with their true meaning by the smoking wreckage on Hickam Field. The whole long chain of events since 1931 fell into line and made a unified pattern in which Japan, Hitler Germany, and Fascist Italy had equally and alternately supplied web and woof. The pitiful platform of America First crumbled under the feet of the honest and the dishonest who stood upon it They went underground but only to await a more favorable moment under another name The measures by which this country had been brought to some degree of preparedness and warned of what was in store were no longer "war-mongering" except to Dr. Goebbels. They became what in the light of our mood and reluctance to face realities will be acclaimed by history a marvel of one man's persistence and courage even in the days when statesmen and nations in peril of their lives were seeking to appease the unappeasable And who is there among us that did not at some time during that long trek have his misgivings about the end of the road for a people at peace in taking even the most obvious steps in preparation for war? In contrast I recall the answer of an influential English statesman when asked if no one in authority in England or France had read *Mein Kampf* for what it was. The answer was that to them it seemed only the ravings of a madman, something unthinkable as a program Only in 1934, when the reports of naval and military attachés gave it a touch of reality, did the Baldwin ministry consider what might be done—and did nothing, because the country was not ready for it and would have thrown out the party in power Let us not be too harsh on the shortcomings of the Baldwin and Chamberlain ministries. They are the price democracies pay for their attribution to other peoples in the matter of foreign affairs of their own motives and sense of values. It will be balanced at a terrible cost by the even greater error of those who mistake might for right and democracy for decadence The answer to the doctrine of a *Herrenvolk* echoes from the mountains of Norway to the mountains of Greece, but the words were phrased by an old farmer in the Middle West, words I have never forgotten, "God never made any men to rule others without their consent"

There can be no manner of doubt that the American people will follow to the end of the furrow the red plowshare of war to which they have set their hand. Will they be too weary to turn about and run that second parallel furrow necessary to make a firebreak against new wars? It is this question that must concern us even in the midst of war. There was a decade in which we did make some preparation for war There will be no decade in which to prepare for peace The carnage of war may incline us to buy too cheap a peace, one in which the futilities of retaliation will be substituted for a more durable reconstruction. The readiness of America to sacrifice for peace when it enters the scene, not its grim determination to win the war, is what I have in mind today Freedom from want and insecurity, freedom for the self-expression of individuals in their chosen groups, these alone can bring freedom from war We can have them for ourselves, but there will be no freedom from war for us unless we make the same freedoms available to others That is the burden our own freedom lays upon us It is a heavy one, but it must be borne or we shall wait in false security behind our equivalent of a Maginot Line and a West Wall for the next war

So far I have ventured only a cautious phrasing of one generalization that America is agreed that the old isolation is gone beyond recall The evidence of that is plain to everyone but the *Chicago Tribune* It is plain in the utterances of Mr Willkie, in the Chicago statement of the Republican National Committee, in the proposals for world organization of Governor Stassen in a state where all but one of its congressional delegation had an almost 100 percent isolationist record in Congress before Pearl Harbor We still have a Johnson, a Nye, and a Wheeler with us, but the degree of our participation in buttressing the peace will be considered free from the obscurantism of a Borah and the personal rancors of a Lodge If others like them arise, and they may in either major party or among doctrinaire liberals who hold themselves above party, they will have less chance of creating a confusion that will make American participation in the peace and revulsion to normalcy afterwards a crushing defeat for a world that expects much, almost too much, from our leadership. They will have less chance of leading us back into isolation and away from active participation in an integrated world, *but they will have a chance.* The strongest words of the political leaders in both great parties cannot be repudiated openly now, but I recall what happened within a few days after the Germans first asked for an armistice in October, 1918 I consider the chances of sabotaging the effective participation of the United States in the enlightened world reconstruction necessary to its own security and prosperity greater than I did the defeat of our participation in a simpler program in October, 1918

The reasons for this misgiving about our ability to take a long-time view of our own interests arise out of the nature of the only kind of peace that has a chance in this shrunken and interdependent world. It stems from the want of information about the dependence of peace on our willingness to sacrifice now for a future security

The problems of a post-war settlement, a term more appropriate and more probable than the old conference-drawn treaties, will, if realistic, have much to do with a "live and help live" world economy Such an economy must provide for the greatest possible freedom of interchange of raw materials and of the finished products of men's hands and men's minds It must include the conquered as well as the victorious nations It must formulate the conditions of life in a technologically and economically interdependent world where nations as political and cultural entities will yet survive. Each must thrive if all are to be safe from the major discontents that may bring down the whole structure of peace in ruins The intricacies of such a settlement and the breadth of view it demands will tax the best minds. The comprehension necessary to the acceptance of our part in it as long-term wisdom and enlightened self-interest will not be achieved overnight by Congress or the people It is the degree and the implementation of our abandonment of isolation that will alone determine our national will to pay the price of peace for succeeding generations

It is not necessary, nor is it just, to indict a whole nation for economic illiteracy because they cannot see the intimate and necessary relation between the prosperity and content of other peoples and their own possibility of being prosperous and at peace When it has been common to think in terms of visible items only in the balance of trade, to think of gain in any trade as a one-way matter, when for a century farmers who sell in a world market barter their interest to the groups who put tariffs on what they buy, when labor still thinks that high tariffs make for high wages, when the economic health of one people is thought of as the ill of another, when the sale of machines and other capital goods to build up the economy of another area seems suicidal, when lowered profits and greater volume are not seen as creating a broader-bottomed stability in business both domestic and international, is there not reason for concern about something more than our part in policing the world or adhering to a global or a regional organization or a combination of them? If for twenty years following this war Great Britain clings to imperial preference agreements and nineteenth-century imperialism and the United States clings to seventeenth-century mercantilism and blithely ignores the inevitable adjustments made necessary by the change from a debtor to a creditor nation, we shall have but another armistice between wars. No one who has watched the present battle against inflation or remembers the Fordney-McCumber and the Smoot-Hawley tariffs but must have some misgiving that whatever the terms of the world settlement, group interests and demagoguery among us may combine to scuttle it.

Many are concerned, and rightly so, about the serious problem of our people's understanding of the gravity of the issues when the world, and America one of its leaders, faces adjustments basic to a durable peace Their anxiety is justified by recent sounding of public opinion on a nation-wide scale by the Foreign Policy Association This poll showed that there was acceptance of the idea that the outcome of the war will bring profound changes The East was concerned with the degree of governmental supervision in realms hitherto left largely to private initiative For the Midwest the summary was that the section was "wholeheartedly for the maintenance of peace once this war is won, but it has almost no understanding of the economic implications of effective international organization for that purpose " In the Far West the report said·

> A large part of the public has reached the point of being willing to spend money which may never be repaid in terms of money for the rehabilitation of devastated countries But when it comes to sacrificing other things, the readjustment of attitude is harder, and broadly speaking has scarcely begun We want to sell goods for money, and will even lend our customers the money to buy them at the risk that they may not pay that debt in cash But to let them repay with their own goods, which might compete in our markets with our products goes against our whole habit of thinking It will take far greater shocks than we have yet experienced to jar much of the business mind loose from its traditions.

As for the present Congress, we shall see a partial revelation of its mind when the debate comes on the Gillette resolution and on the renewal of the President's or Mr Hull's authority to negotiate further reciprocal trade agreements. It will be a dress rehearsal that the world will watch. It will reveal in part at least the answer to the question of what it will mean when America enters as a participant in the difficult task of post-war reconstruction

I said it would answer this question in part. The final answer may be given, if the war continues, by the next Congress elected amid a still greater circle of the discontents and deprivations inevitable as the war needs press upon those who do not realize we are all combatants in an all-out war How easily the petty things in civilian life may be used for political advantage and may obscure the greater issues both of war and peace was brought home to me recently At a dinner I sat beside a prominent politician, called a statesman by his partisans at election time He illustrated what I fear in greater measure later by saying that the Campaign of 1942 was the easiest he had ever participated in He did not have to argue any issues. All he did, he said, was to say

> Sure, we are all in favor of winning the war That is no issue between us and our opponents Pre-war records are no longer important But there are and must be things you don't like somewhere in the program The only way you can express your discontent is to vote for the outs against the ins.

It was so easy he was afraid of too great success on election day and the consequent responsibilities. Such a campaign, I may add, defeated one of the most constructive members of the last Congress and re-elected one whose choice must have pleased Dr Goebbels These things are the realities in the battle of America that is before us. They are startlingly reminiscent of what happened at the close of the last war. They seem to underwrite a sentence in the closing chapter of Quincy Wright's great study of war. In it he emphasizes, as I have tried to do, the necessity of making the large public understand the sacrifices that peace exacts. He concedes that the statesmen we accuse of short-sightedness in their failure to take measures to avoid this war could not always do otherwise "They were bound to put the conception of national welfare held by the less literate masses of their populations ahead of any conception of world welfare which they or the general opinion of the literate from all countries might have held " If this judgment is correct, there faces the democratic nations who are to sit at the peace table an educational task fully comparable to what they have done and are doing to prepare their rank and file for making war. Nor can it wait for the end of the war. From that mistake less than a generation ago, the mistaken belief that the waging of a war automatically adjourns all discussion of the peace to follow, flowed consequences that plague us today as we fight a second great war.

There is one other important consideration that adds complexity to the task of forecasting the ultimate American attitude toward world reconstruction It arises, as do the demands for a reorientation of the thinking of the common man, from domestic situations and mooted questions of domestic policy during the last decade The making of a peace following what is in many aspects a world revolution rather than a war will find powerful domestic groups still fighting against the limitations on unrestricted individualism, corporate and personal, made necessary in behalf of the common man Most of these measures commonly called the New Deal were adopted thirty or forty years ago by many nations fully as democratic as our own In most cases, as in our own, they were aimed at preserving free enterprise or the capitalistic system by removing those evils that were fuel to the fires of factions that would destroy it. Only against the background of our American attitude on individualism and government by laissez faire could such mild and belated regulation in behalf of the common welfare be considered revolutionary That they were and are so considered, even when they were the inevitable outcome of the greatest economic collapse in world history, must be evident to the most casual observer Representatives of all the groups, agriculture, labor, and capital, who are the long-time beneficiaries have from time to time voiced their opposition to remedial legislation or to anything that savored of a national inventory and national planning In the midst of working out the compromises and adjustments necessary to the functioning of our domestic economy even in a world at peace, we are precipitated into a world war that threatens every material and spiritual value explicit or implied in it Will those who refused to see that the good neighbor policy means first of all the neighbor down the street rise to the levels of thinking required by a peace that must consider for our own good the neighbor in far distant lands? Is there not disturbing evidence in the public press and in the halls of Congress that many are confusedly fighting the domestic war with more vigor and singleness of purpose than they are fighting the overshadowing dangers from the Nazi program? Will they not carry over that attitude when peace releases them from all restraints? What riders or restrictions will they want to attach to a settlement that implements specifically the Atlantic Charter and the Four Freedoms? What acceptance will men who do not see over or through long-time domestic policies for the interests of the common man give to a treaty which will not be dictated by us but be a compromise achieved by the victors moving to the right or left of the policies they maintained in isolation The only possibility of one nation dictating a peace in the interests of its narrow nationality would be one written by the leader of the *Herrenvolk* against whose philosophy we fight

There remains one inescapable question among the many that might be raised about America as she takes her place at the peace table That question may not be voiced in the fellowship of the United Nations but it will be in many minds at home and abroad It will spring from our own record after the close of the last effort to wring good from the evils of war Will we fail our leaders and spokesmen as we failed Woodrow Wilson? The question will be there, whether our voice at the peace table is that of Roosevelt or Willkie or Wallace or Stassen speaking clearly Behind voices like these our allies will hear the overtones of a new Harding calling us back to normalcy and to a hasty material and spiritual disarmament The memories of other peoples of what happened so recently in America will be revived by our discussions and decisions before the war closes These, and these alone, will reveal how much reality there is in our present vague willingness to abandon isolation Who are we to talk glibly as some do about watching out that our allies do not mislead us at the peace table, we who failed the little nations and gave the great ones their excuse to make a travesty of the ideals we had proclaimed to a sickened world? If for a second time we enter and withdraw in the face of the world's need for the hopeful leadership of a young and powerful nation, the designation of perfidious will be ours in all languages and on the tongues of generations yet unborn If we fail to assume the burden of freedom as we have assumed the burden of war, our children as they march to new wars will apply it to us.

If we are to help lead the world toward a unity that demands sacrifices of all for gains that are imperishable, we must first educate and discipline ourselves. The time is short, the task a great one He who says that until the war is won there should be no talk of peace is mistaking victory for peace and preparing us to yield through war weariness to all "those subconscious trends of opinion [that] are all bound toward passivity and isolationism." Seeing that danger, the reality of which it has been my purpose to present, we shall have no excuse for not girding to meet it.

SOCIAL AND ECONOMIC IMPLICATIONS OF FREEDOM FROM WANT OF FOOD

FRANK G. BOUDREAU
Milbank Memorial Fund

(Read February 19, 1943)

FREEDOM from want of food—for all men—in all lands has never been experienced by mankind. Comparative freedom from want of food for some of the population in the more prosperous countries is a phenomenon of modern times.

Two quotations illustrate my meaning:

> I have often turned it over in my mind, why it is that although the world is the same as it was of old, nor is there any change in the revolution of the sun or other stars, nevertheless it is exceeding rare that a person is born in these times who can make any advance in the useful arts—no one, indeed, seems now to stand forward as in ancient times did Phidias among sculptors, Appeles among painters, Plato and Aristotle among philosophers or Hippocrates and Galen among physicians. This, I say, greatly perplexes me, especially since the approach to useful arts is made easy for us by the writing of the ancients, so that knowledge which they acquired only by earnest vigils and labor, we can acquire very quickly.
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> And when I considered the cause of this thing it occurred to me, after some study, that Galen had given the solution by his statement that a right use of food and drink produces not only a good condition of the body, but renders also the mind more vigorous, while a bad use of food and drink not only impairs bodily health but destroys the good habits of the mind and distracts the intelligence from its proper duty. When men therefore in that fortunate age established for themselves right conditions of living, they created healthy conditions both for mind and body.

This was the ingenious explanation of Oddo degli Oddi,[1] who wrote in 1538 at Lyons, for the lack of intellectual advance in his time.

A modern writer explains the great change which took place in the eighteenth and nineteenth centuries in much the same way:[2]

> Sometime in the middle of the eighteenth century, a change came in the affairs of men, showing itself in the freedom of thought and speculation which, in the nineteenth century, brought railroads, steamships, machinery and all that vast expanse of physical science which still—though part of our daily life—is a daily wonder to us all. What happened a hundred and fifty years ago to open to us the treasure chest of knowledge? For thousands of years man lived on earth more or less as his ancestors had lived, and then came advance in every direction. What had been impossible before became possible to the men of the late eighteenth century and of the nineteenth century. What was this change? The question admits of but one answer. It was an increase in the surplus created by men's labor after the necessaries of life had been provided. Sometime, therefore, about the year 1750, man's labor began to be more productive.
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> The primal daily need of every living thing is food, and before the eighteenth century there had been in varying degrees of intensity a constant lack of food. If, therefore, at this time man began to have the leisure for study, which he must have if advance in knowledge is to be made, if men began at this time, in Sismondi's phrase, to meditate and apply to the arts the fruits of their study, it must be because during the eighteenth century food was slowly becoming more abundant and cheaper. Hungry men do not meditate about arts, as Dr Samuel Johnson says, "He that pines with hunger is in little care how others shall be fed." Abundance of food at prices within reach of all is the first great need of human welfare. Food adequate to relieve this need is the achievement of the eighteenth and nineteenth centuries, and the Conquest of Hunger, the high production which machinery brought to a comparatively small population, is the conquest from which all present-day comforts have sprung.

Primitive methods of tillage bound men to incessant back-breaking toil to win temporary freedom from want, but hunger and famine were never far distant until discovery of the Americas brought new foods and new lands, and the advance of science brought modern methods of production. In a communication to the Royal Statistical Society in 1846 William Farr states:[3]

> In the eleventh and twelfth centuries famine is recorded every fourteen years, on an average, and

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[1] Odus de Odus (1538), quoted by Prentice E. Parmalee in *Hunger and history* 140–141, 1939. Born in Perugia in 1478, taught philosophy, and practiced medicine. Taught later in University of Padua.

[2] Parmalee, Prentice E. *Hunger and history*. 2–3. New York, 1939.

[3] Farr, William. The influence of scarcities and the high prices of wheat on the mortality of the people of England. *Jour. Royal Statistical Soc* 9: 158, 1846.

the people suffered twenty years of famine in two hundred years. In the thirteenth century the list exhibits the same proportion of famine; the addition of five years of high prices makes the proportion greater. Upon the whole scarcities decreased during the three following centuries, but the average from 1201 to 1600 is the same, namely, seven famines and ten years of famine in a century This is the law regulating scarcities in England.

In spite of the advances of science and the ability of small numbers to produce an abundance of food, the law regulating scarcities has continued to operate in practically every country in the world In recent times—in fact, until the outbreak of the war grosser forms of famine had been confined to densely populated countries, like India and China, where primitive forms of agriculture were still practiced and where modern transportation and industrial development had not been attained It was to be expected that the conquest of famine, the age-old enemy of mankind, could not be achieved within a few decades in such regions But even in the most highly developed countries where an abundance of food was readily available, hunger continued to be the lot of relatively large sections of the population at periods coinciding with economic depressions. In this respect Farr's law regulating scarcities in England from the thirteenth to the seventeenth centuries has continued to operate in modern times, even in the great democracies. But it has continued to operate in the face of an abundance that could not be sold Social and economic systems have not been designed to bridge the gap between farm abundance and low purchasing power. In the period between the two world wars food surpluses or gluts haunted the minds of leaders of government while breadlines formed below their windows and the unemployed sank lower and lower into misery Governments bought up these surpluses, dumped them abroad, denatured them, and destroyed them The smoke rising from burning mounds of wheat, corn, and coffee, the shutdown of plants manufacturing clothing and shoes, while millions could not afford to buy these necessities, and of coal mines while thousands suffered for lack of warmth, signalized the bankruptcy of government In these circumstances the outbreak of a second world war could not have come as a surprise to the most casual student of human affairs.

The seeming abundance of the pre-war period is fast becoming wartime scarcity. Rationing has been introduced into the greatest food-producing countries because of impending or actual shortages Hunger and famine affect millions in Asia and throughout occupied Europe Under the whip of war the great democracies are slowly and reluctantly adopting policies which provide for the distribution of food according to man's need rather than according to his ability to pay for it. Much progress has been made along this line in Great Britain, much less progress in this country Given equal amounts of food in proportion to population, the present food policy in Great Britain means that the British people would be better fed than the people of this country Naturally, the problem in Great Britain is much simpler than here, and the whip of war has not cut us so deeply But there are other reasons for the difference. During the decade before the outbreak of war methods of providing food for those who could not afford adequate diets became more liberal and enlightened in Great Britain This was also true in the United States of America, but our policies for improving nutrition were based upon the existence of food surpluses rather than upon the individual's need We had the food stamp plan whereby foods in surplus supply were provided for certain low-income groups Surplus foods and WPA assistance were the basis for an extensive system of school lunches Surpluses of liquid milk gave rise to the various schemes for its free or low-cost distribution Now all food surpluses are fast disappearing and the WPA has been dissolved In spite of these difficulties considerable progress in the distribution of food according to need is being made, but if our people are to be as well fed as the British on proportionate amounts of food, new methods of distribution will have to be worked out so that our relatively more abundant supplies may be as readily accessible to every person according to his need

The advance in science made possible by man's hard-won freedom from constant preoccupation with food production has brought us, in the last quarter of a century, greater knowledge of man's food requirements than of any other of man's physical needs. Incidentally, it has also brought us even greater knowledge of the methods of feeding livestock. Thanks to this knowledge animal husbandry is fast becoming an exact science. If the economic urge were as strong, our knowledge of human nutrition and its application would advance just as rapidly.

But there is no need to apologize for any lack of progress in our knowledge of human nutrition, for it far exceeds our present willingness or ability to apply it for the benefit of human welfare Bring together any group of authorities in human nutrition anywhere in the world, and they will soon reach agreement on the amounts of the various nutrients required to maintain health Twelve physiologists from different countries meeting for three days in Geneva set out dietary standards under the auspices of the League of Nations in 1935 Since that time similar standards have been adopted by the British Medical Association, by the Canadian Council on Nutrition, by the Food and Nutrition Board of the National Research Council in this country, and by many other groups These standards differ in detail, but for all practical purposes they are almost identical The reason for their similarity is not far to seek, for they are all based on the results of research in laboratory animals and in human beings The evidence on which they stand is identical, any differences are due to differences in its interpretation, or to the availability of new evidence as the science advances

Classes in any country whose diets coincide most closely to these standards enjoy the highest known levels of health and fitness, and the greatest freedom from disease and premature death Conversely, the further the diet of any class or people falls below these standards, the lower becomes their standard of health and physical fitness, the greater their susceptibility to disease and premature death No authority in animal husbandry would be surprised at such a statement in relation to the feeding of livestock, but when it is made with reference to human beings, it is too often met with indifference or scepticism

These dietary standards are the same for all the people in the world The amounts and kinds of food necessary to meet these standards differ widely according to race, climate, habit, and available foodstuffs The standards relate to the essential nutrients in the foods such as protein, calories, calcium, iron, phosphorus, amino-acids, and vitamins. The amounts and kinds of these nutrients required by the poor and rich, the white and yellow, the savage and the highest product of Western civilization, are identical, although amounts and kinds of food which they consume may and often do differ widely.

Dietary standards adopted by authorities in nutrition have something else in common, the diets of a large but varying percentage of people in every country fail to measure up to them. The conclusion is inescapable that the diets of such people are not adequate for physical fitness and sound health

Another similarity between all the dietary standards adopted by all of the various authorities in nutrition is that they are most apt to be met by well-to-do families whose choice of foods is not limited by purchasing power Families in the lowest income groups consume diets which are the most deficient, well-to-do families enjoy diets which measure up most fully to the standard for health. In every income group some families select better diets than others, but as income declines, it becomes increasingly difficult to obtain the required nutrients from the restricted choice of foodstuffs available. And good diets are particularly needed by certain classes in the community without regard to income pregnant and nursing women, infants and growing children, adolescents, hard manual laborers of both sexes, and invalids It is for these classes that special provision is made in wartime in Great Britain Governments of every country at war spare no pains to provide the best possible diets for the members of their armed forces, but only a few have so understood the nature of total war as to extend this measure to war workers in factories and to civilians generally

The science of nutrition is a new science and has not had time since its development greatly to influence economic and social policy Hence agriculture has not been oriented towards the goal of providing the proper nutrients for human food In many countries agricultural policy has been influenced by the attempt to achieve self-sufficiency This has meant preference for crops of grains and sugar which provide large amounts of food-fuel which can be stored for use in time of war. Human beings need bread but they also need the protective foods which are as a rule the expensive foods milk and milk products, meats, eggs, leafy green and yellow vegetables, and fresh fruits. Real or fancied lack of security in small countries has led to subsidies and protection for crops of grains and sugar which can be produced most efficiently and cheaply on the fertile plains of Canada, the United States of America, Russia, Australia, and the Argentine. Concentration on such crops in many small European countries, in the period between the two world wars, has constituted a wartime agricultural policy, and these countries will tend to return to that policy after the present war unless special efforts are made to appease their fears and to influence them to adopt a policy of diets adequate for health for all of their people.

The positive effects of good diets, particularly in animals with a short span of life, are plain to all. Dr Henry C Sherman,[4] one of the greatest authorities in nutrition, has a colony of white rats whose ancestry is known for as many generations as would take human beings back to the time of Charlemagne. During all of these generations these animals have been healthy and strong, their coats have been glossy, they have been normally active, and they have produced normal litters. Some years ago Dr Sherman began adding to their food, which he had every reason to believe must have constituted a good diet, extra amounts of milk solids. Promptly the animals began to grow faster, to mature earlier, and to live longer. These observations have been repeated again and again, each time similar results have been obtained. In laboratory rats the span of useful life was extended by 10 percent, which would be equivalent in man to six or seven years. According to Dr Sherman, man is more susceptible than the rat to improvement through diet, hence one would expect even better results could man be led to consume a greater proportion of the protective foods.

Freedom from want for all men in all lands is a promise held out by the Atlantic Charter. There are various methods of achieving such freedom, such as universal employment, public works, measures for social security, and housing schemes for low-income groups. It may be necessary to utilize every one of these and many other methods. But there are many reasons why it would be logical to begin with freedom from want of food, understanding that phrase to mean diets adequate for health by modern standards of nutrition for all the people. Dietary standards are the only human standards which are the same throughout the world. Fear of hunger is the most widespread fear in the world at the present time. And farmers who are asked to increase their production of food in wartime and who live in fear of a slump in demand and in prices when peace comes, in view of their bitter experience after the last war, would be reassured if adequate nutrition policies were adopted now by the several governments of the United Nations. For such policies would provide an expanding market for agricultural products for years to come.

In this connection it is worth while to consider how far the supply of foodstuffs falls short of the need in our own country. This has been calculated on the basis of pre-war consumption.[5] The standards used were those of the Food and Nutrition Board of the National Research Council. To meet these standards, low-cost diets were formulated for low-income groups, moderate-cost diets for families of moderate income, and higher-cost diets for families of high income. These are known as best adapted diets. Hence in variety and cost a large margin would remain between the different income groups, but all would obtain from their diets the nutrients necessary to meet the standard for health. On this basis there was a pre-war deficiency of 59 percent in leafy green and yellow vegetables, of 45 percent in milk, 28 percent in citrus fruits and tomatoes, 25 percent in beans, peas, and nuts, 17 percent in eggs, 14 percent in potatoes, 4 percent in meat, poultry, and fish, and 2 percent in flour and other cereals.

Thus it will be seen that to gear production in this country to actual consumption requirements would mean a considerable reorientation of agriculture. The acreage[6] for truck crops would need to be increased by 75 percent, that for fruits by 19 percent, while the number of milk cows would have to be increased by 39 percent, hens by 23 percent, sheep and lambs by 16 percent, hogs by 15 percent, beef cattle by 7 percent. A production program designed to furnish best adapted diets to all the people in this country, would require the use of more land for food and feed crops than is in prospect either through the reclamation of new land or through the replacement of acreage now used for non-food commodities. This would mean a program to increase yields per acre, calling for improvements in technological practices, and a demand for many varieties of industrial products

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[4] Sherman, H C *Chemistry of food and nutrition*, ed. 6 539. New York, 1941

[5] From studies of the Bureau of Home Economics and the Bureau of Agricultural Economics, United States Department of Agriculture.

[6] From studies of the Bureau of Agricultural Economics, United States Department of Agriculture

Sir John Boyd Orr[7] has estimated that to raise the level of consumption of all persons in the United Kingdom to that of the top 10 percent (that is to an average weekly expenditure for food of 12 shillings or two and a half dollars) would require increases of fruit 124 percent, vegetables 87 percent, milk 80 percent, eggs 55 percent, butter 41 percent, meats 29 percent. This country and Great Britain are two of the richest nations in the world. If their needs are so great, one can imagine how much greater must be those of China and India. No hope should be held out that such standards could be met by food policies alone or within a few years of time. Measures other than those directed towards agriculture and import would be required to draw off from the land the great excess of population. Enormous industrial developments and great public works, involving large capital investments, would have to accompany the measures taken to increase the yield of foods. Nevertheless much would be gained by beginning with a policy of diets adequate for health, for all would understand and co-operate in such a policy, and it would help to prevent mistaken attempts at economic nationalism and agricultural self-sufficiency.

A policy of diets up to the known standard for health for all the people would be a costly policy in the beginning, and it would prevent governments from subsidizing the production of uneconomic crops. Wheat and sugar can be delivered in Great Britain more economically than they can be raised there. But Great Britain can raise vegetables and certain fruits, eggs, and milk as economically as she can import them. This would mean a great decrease in the acreage devoted to wheat and sugar and a large increase in the acreage for vegetables, fruits, and pasture. A sound nutrition policy would therefore increase the international exchange in foodstuffs rather than diminish it.

Some idea of the cost of such a policy may be gathered from the present experience in Great Britain, where the need for adequate diets is so great that the Government pays the producer the price that is necessary to obtain the desired production, and sells the food to the people at a price they can afford to pay. This calls for an expenditure of about seven hundred and fifty million dollars a year. It is a marked departure from the usual pre-war policy of governments, which was to subsidize restriction. For example, when there was unemployment and more food was produced than the people could buy, governments bought up the surpluses which always haunted them afterwards, or paid producers to restrict production. The aim was to prevent a break in prices which would have ruined the producer, but while this aim may sometimes have been partly achieved, it was accomplished at the expense of the consumer, at a high cost in public welfare. By subsidizing consumption instead of production, the government spends no more, maintains production, and greatly improves the health and welfare of the people. Agriculture is the principal occupation of man. About 60 percent of the world's gainfully employed population is engaged in agricultural pursuits. The proportion varies from about 35 percent in Europe to over 70 percent in Asia and Africa. Food production probably represents 90 percent of the total activity of world agriculture. Thus the conditions under which farm people live and work are the most important social problems of most countries. A policy which will maintain farm production at a constantly high level, which provides a constantly expanding market for its products, will make itself felt throughout the economic system. When agriculture slumps, industry suffers. When agriculture booms, industry thrives. So many industrial products would be needed to bring agriculture up to the level of efficiency necessary to produce all the needed food economically, that industry too could count on an expanding market for years to come. There would be a heavy demand for all kinds of farm machinery, lumber for barns and houses, dairy utensils, and fertilizers. Refrigerators would be needed in our own South for the expanding dairy industry, as well as cheese and butter factories, plants to extract soya and peanut oil and to mill the residue, and factories to dry milk and dehydrate vegetables and concentrate citrus fruit juices. Reorientation of agriculture to provide diets on the health standard for all of the people would cause new blood to flow through the arteries of industry, commerce, and transportation.

Promotion of international co-operation would be one of the most important results of this policy, for few nations could provide, from within their own frontiers, the food needed to raise to the health standard the level of their peoples' diets. In order gradually to bring up this level in the poorer countries, large imports of food would be required In the more advanced, highly industrialized countries, staple foods requiring large acreage would need to be purchased abroad International agencies would be needed to regulate this exchange, and to assist individual countries to reorient and to improve the efficiency of their agriculture There would need to be international shipping, credit, technical, and other authorities, and the work of these in turn would require co-ordination by an over-all world economic authority responsible to a world political authority How badly the war will have affected our economic, social, and political systems cannot now be foreseen, but we may be sure that they will be in desperate need of rebuilding and rehabilitation The adoption of sound food policies now, based on our knowledge of the science of nutrition, aimed at the promotion of public welfare, will do much to restore these tottering institutions and to provide a common meeting-ground for the nations of the world.

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[7] Orr, John Boyd. *Food health and income*, ed 2. London, 1937

What might we expect, in terms of human health and welfare, from the adoption of such policies? We know that health is the foundation of well-being and that an adequate diet is the foundation of health We know that there are great differences between the disease and death rates of the people in different countries, as well as between the different regions and classes in any one community. We find, as a rule, similar differences in the adequacy of diets between these countries, regions, and classes In our own country disease and death rates are highest where planes of living are lowest, there also are found the poorest diets It may not be possible to prove direct cause and effect, but the circumstantial evidence is very strong Every dietary study reveals that in general the adequacy of the diet declines as income falls and rises as income increases That is because the protective or health foods are the best-liked and most expensive foods. Every study of nutritional status shows greater prevalence of malnutrition among the poorer classes More positive evidence comes from providing better food to school children or other groups whose diets are poor This has been done, time and time again, on a controlled basis, the supply of extra milk and other protective foods to half of a group of school children is a common example The invariable result is more rapid rates of growth and better health. Greater progress in studies is usually recorded The conclusion must be that such children have not been consuming diets which were fully adequate for health

The best-fed countries experience the lowest death rates and enjoy the longest expectancy of life There may be other factors at work, but food is certainly one of the most important In these countries death rates from diseases which are known to be influenced by nutrition are particularly low The five countries with the lowest infant mortality (average 1931-1935, and 1938, 1939) are New Zealand (whites only), Australia, Holland, Norway, and Switzerland Countries with the lowest death rates from tuberculosis (1936) are Australia, New Zealand, Denmark, Holland, and the United States of America Greatest expectation of life at one year of age is found in Holland, New Zealand, Australia, and Denmark, whose one-year infants have the prospect of 67 years of life

Comparisons of vital statistics within countries reveal similar differences between rich and poor regions as well as between well-to-do and low-income groups According to the *Final Report of the Mixed Committee of the League of Nations on the Relation of Nutrition to Health, Agriculture and Economic Policy*, "the general mortality rates in poor districts are 50 percent higher than in the wealthier ones, while tuberculosis mortality is almost four times as high in the former as in the latter and the corresponding proportion of infant mortality is as two to one"

The United States National Health Survey [8] showed that the annual per capita volume of disability in the relief group is three times as great as among upper-income families—nearly twelve days as compared to less than four Non-relief families with incomes under $1,000 experienced a volume of disability twice as high as that in the highest income group Similar evidence is found when we turn to specific death rates from such diseases as tuberculosis

Even more positive evidence is beginning to come from studies of human nutrition Supplements to the diets of half of a group of low-income pregnant women [9] resulted in relatively shorter and easier labor, fewer complications and premature births, no deaths among the offspring as compared to about 15 percent in the control group, and relative immunity of the infants during the first year to many common diseases of children. As such controlled studies multiply, seeking to ascertain the actual results of substituting a complete for an inadequate diet, evidence piles up that diet is a major cause of the differences in sickness rates, death rates, and expectancy of life between low- and higher-income families.

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[8] Britten, R H, S. D Collins, and J. S. Fitzgerald. National Health Survey Some general findings. *Public Health Reports*, March 15, 1940.

[9] Ebbs, J H, F F Tisdall, and W. A Scott The influence of prenatal diet on the mother and child. *Jour Nutrition* 22 (5) 515, 1941

The food policy which authorities in nutrition have been advocating has been pursued half-heartedly but on an ever more consistent and thorough basis by all freedom-loving peoples. Bringing this policy to full fruition requires only a few more steps. Our determination must become hardened as the science of nutrition reveals more fully the true results of adequate diets in the promotion of more vigorous and lasting health and the restriction of disease and premature death. Our food policy now and what I hope it may be in the future stands in vivid contrast with that of our enemies.

"In stilling the pangs of hunger," says Marshal Hermann Goering, "the Germans come first." Nazi policy in Poland shows that his words are to be taken seriously. For although, according to the Office of War Information, "there is enough food in and around Warsaw, it either goes to Germans on the spot, is shipped into the Reich, or sent to feed German troops on the war fronts. Even if they received all the food allowed under rationing, Poles would not subsist for long. The Nazis have planned it that way."

John G. Winant,[10] our Ambassador to Great Britain, has expressed the views of the United Nations in these words:

> When war is done, the drive for tanks must become a drive for houses. The drive for food to prevent the enemy from starving us, must become a drive for food to satisfy the needs of all people in all countries. The drive for physical fitness in the forces must become a drive for bringing death and sickness rates in the whole population down to the lowest possible level.

Our Vice President[11] has said:

> Modern science, which is a by-product and an essential part of the people's revolution, has made it technologically possible to see that all the people of the world get enough to eat.

Finally, in the words of Sumner Welles:

> There is no limit, then, to the material prosperity which is within the reach of the United States, and of mankind. The great thing that has happened in our time is that mankind at long last has taught itself enough of the means and techniques of production, of transport and of scientific agriculture so that it is technically possible to produce and to distribute on this planet the basic physical necessities of health and decent living for all of the world's people.

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[10] War and peace aims. *United Nations Rev.*, special suppl. 1: 51, 75, January 30, 1943.

[11] *Ibid.* 50.

PROBLEMS OF POST-WAR INTERNATIONAL MONETARY STABILIZATION

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(Read February 19, 1943)

MUCH thought is now being given both inside and outside government circles to the problems of international monetary relations after the war In this as in other aspects of post-war planning, there are too many unknowns to permit of any very precise blueprinting of future plans, and yet we have to recognize that if we do not begin now to think through the problems, define objectives, and so far as possible reach agreements upon the broad outlines of post-war monetary organization and policies, we shall probably be letting ourselves in for another long period of demoralization such as that which occurred in the period between the first and the second World Wars

In that period, we learned much about the international monetary problem, and our planning for the future must take account of these lessons The first World War produced revolutionary changes in the international position of the leading countries. German foreign assets were virtually destroyed. England lost important parts of her export trade, and our own position underwent a sudden shift from international borrower to lender During the war years, the effects of these and other changes were largely concealed by the steps taken to peg sterling and other currencies, mainly by the use of credits from this country, including particularly the government advances which later became the source of so much controversy and confusion under the name of the Interallied Debt.

The suspension of the exchange-pegging operations in 1919 revealed fully the breakdown of the international gold standard which the war had produced, and introduced a period of the wildest currency disorder. Depreciation of European currencies and fear of further depreciation, combined with the general political and economic uncertainty, led to those erratic flights of capital which continued throughout the interwar period to be perhaps the chief impediment to the establishment of international monetary stability. The disorder of the early twenties was marked especially by the great inflation which ended in the complete destruction of the German and other currencies of Central and Eastern Europe, and by the slower and milder inflation in France, Belgium, and Italy

As we look forward again to a post-war period, we find grounds for hoping that with proper planning some at least of these experiences need not be repeated From the standpoint of post-war monetary complications, the Lend-Lease arrangement is so vastly superior to the Interallied Debt as to warrant for its originator, whoever he may be, the name of genius It seems probable also that this time the error of reparation payments and the transfer problem may be avoided Since, moreover, most nations will come out of the war with systems of exchange control, it should be possible, if the transition to peace conditions is wisely planned, to avoid the phase of monetary demoralization in the immediate aftermath of the war

Following this initial phase after the last war, the leading countries adopted monetary policies directed toward bringing their currencies back to gold, the British stabilizing the pound at pre-war gold parity and the French Government stabilizing the franc at a depreciated rate Among economists the opinion prevailed that the pound had been overvalued and the franc undervalued England was placed under the necessity either of effecting a downward adjustment of her costs of production or of securing a general rise of prices abroad, and the question of where to place the emphasis and the blame for failure to achieve these conditions occupied a prominent place in the monetary literature of the middle and late twenties The English economists stressed American unwillingness or inability to have our prices rise, with the result, as Keynes put it, that the world's gold was being buried in the vaults of Washington, while Americans were more inclined to stress England's failure to reduce her costs As we look back now and recognize that we were in the early phases of our great boom leading to the crash of 1929, the English reproach seems pointless but perhaps typical of the kind of conflict of viewpoints that arises when such fundamental decisions about exchange stabilization are taken by countries independently, rather than by joint agreement

While England by stabilizing at too high an exchange rate remained subject to a constant hazard of losing gold, the stabilization of the franc at a depreciated rate led to an inflow of gold But the insensitivity of the French monetary and price system prevented the gold inflow from having the corrective effects on the French balance of payments which gold standard theory requires, with the result that France continued for several years to draw gold from other countries and to exert deflationary pressure upon them This episode, no less than the British, showed that the finding of a sustainable level of exchange rates is a matter of international concern and cannot wisely be left to independent national action

The British and French difficulties in the twenties and the new general collapse of the gold standard during the great depression led to an increasing insistence by many economists that a system of fixed exchanges was neither feasible nor desirable under modern conditions Trying to maintain external monetary stability meant sacrificing internal stability As the question was put, we were faced with the necessity of choosing between stable exchanges and stable prices This case for flexible exchanges gained further support from the fact that the recovery came first in the depreciated currency countries But it was also true that currency depreciation by these countries increased the deflationary pressure on the other countries until in the end they too were forced to depreciate their currencies We had thus the paradox that depreciation was both a cure and a cause of world depression The vicious circle of depreciation which began with the depreciation of the French and Belgian currencies in the twenties and included both the pound and the dollar during the early thirties was later marked by a second devaluation of the franc and the belga Currency depreciation, by throwing the burden of adjustment on other countries, is a two-edged sword, presenting a constant threat of international economic warfare.

There is one further important piece of evidence from the depression No nation showed any desire to continue with a flexible currency. After cutting loose from the gold standard, what every country did, in one way or another, was to tie back on again, or to seek currency stability in a system of exchange control It is a striking fact, too, that among economists this debate over fixed versus flexible exchanges seems now to have almost entirely faded out, and to have been followed by a general recognition that international currency stability must be one of our main objectives for the post-war period

This brief survey of the interwar experience will have served its purpose if it helps to give some perspective on the problems that will arise after this war and suggests some of the lines on which their solution must be sought In the light of this experience we ought to be able to approach these problems with greater sophistication in theory and methods than we did before I have long believed that international monetary stability must be sought along lines of compromise among alternative schemes of monetary organization and policy For the control of capital movements, especially the short-term movements, it may be necessary to retain some measure of exchange control For the smaller countries, much dependent upon foreign trade and for whom booms and depressions are mainly the reflection of conditions in the larger countries, I would permit some flexibility of exchange rates, under appropriate circumstances and on the basis of some kind of co-operative agreement among the countries affected

It is upon the policies pursued by the larger countries that the fate of plans for post-war monetary stabilization will mainly depend, and it is in these countries that the issues of internal versus external stability, of a national versus an international approach to the problem, are most likely to arise On these questions especially the experience of the past should be most helpful The view that we must choose between stable exchanges and stable prices has long seemed to me an oversimplified statement, indeed even a fundamental misconception of the nature of the problem It arose out of a too literal acceptance of gold standard theory It was probably never true that world equilibrium was maintained through the interaction of international monetary, price, and trade adjustments in accordance with the familiar sequence of steps taught us by Ricardo and Mill There was never a sufficiently large number of countries, sufficiently similar in monetary and economic institutions, or of sufficiently equal economic weight, to produce this result. Indeed it is doubtful if in any one of them the money-price mechanism worked sufficiently like the theoretical assumptions for purposes of short-term trade adjustment. Prior to 1914 world trade was organized principally around England as the center, and the dominant factors in international adjustments were capital movements and the interest rate policy of the Bank of England. This does not mean to say, however, as I shall try to show later, that fundamental price adjustments did not need to be made

Another source of oversimplification or misconception has to do with the business cycle. The classical gold standard theorist thought always in terms of full employment, the money mechanism was only a way of distributing international trade more effectively The modern monetary theorist has pointed out, as in the debate ten years ago, that a method of trade adjustment which involves upward and downward movements of prices will produce inflation or deflation within the countries affected, and internal booms and depressions are too big a price to pay for external monetary stability

But of course the answer is, as experience has repeatedly shown, that the international money mechanism never works satisfactorily under these conditions The gold standard has always broken down in war or depression, nor do flexible exchanges work any better A reasonable degree of stability within the larger countries is an indispensable condition for international economic stability [1] And perhaps all are now ready to admit, despite the "closed economy" analysis which was the real basis for the advocacy of flexible exchanges, that the reverse is no less true There never really was a choice between internal and external monetary stability

To state the problem in this way does not make its solution any easier The view is becoming fashionable that this country can best contribute to international stability by pursuing deficit spending and other expansionist policies at home and exporting capital to develop backward areas abroad. Without entering into the controversial questions about what constitute effective internal policies of expansion, which would go beyond our space, there is danger once more of oversimplifying the problem. We may be faced again after this war with a boom at home and inflation abroad, which would require the use of restrictive measures.

As regards the export of capital, certainly any effective plan for post-war stability must take account of the fact that the United States will be the leading and perhaps the only country capable of large capital exports But our role will have to be carefully thought through Many of the plans being discussed, such as the creation of international TVA's to develop the Yangtze River Valley and the like, would yield results only slowly, and there seems sure to be much discussion, in view of the fact that we now for the first time must accustom ourselves to a large public debt, about the relative desirability of private and public foreign investment We shall have to bear in mind also that in the past capital movements unwisely directed have been one of the most fertile causes of international booms and depressions A repetition of our experiences in this field during the twenties would help neither the world nor ourselves

One of the chief questions raised about post-war plans is whether monetary stability will require the restoration of the international gold standard or whether some better device can be found for maintaining stable exchange rates With the United States holding more than two-thirds of the world's gold, some insist that a gold standard is not possible unless we can find some way of redistributing our gold But this view overlooks the fact that despite our holdings of some 23 billion dollars of gold, the rest of the world has about nine billions, which is equal to the entire gold stock of the world in 1925 In addition, there will be at the end of the war large claims upon us in the form of frozen funds and other foreign assets Even without redistribution of our gold, a gold standard would probably be feasible if it were directed toward preventing further gold inflow to this country and permitting the large annual output of gold to build up the reserves of other countries. The development, moreover, of stabilization funds in some of the leading countries during the thirties was already looking toward the supplementing of gold by foreign exchange balances, and it seems certain that any plan adopted for the post-war period will be of this character.

To me it does not seem helpful to pose the problem as one of choosing between the gold standard and some other standard, unless by "other standard" we mean flexible exchanges or exchange control. The gold standard has undergone a great deal of modification since the classical economists first talked about it, and any future standard making use of gold will probably be even more sophisticated than those with which we experimented in the period between the two wars What we probably have been searching for is a gold standard that would bend without breaking[9]

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[1] See my papers, "The world's monetary dilemma—internal versus external monetary stability" (*Proc. Acad. Political Sci.* 16 (1): 62–68, 1934) and "The adequacy of existing currency mechanisms under varying circumstances" (*Am. Econ. Rev Suppl.* 27 (1)· 151–168, 1937)

But one fundamental tenet of the gold standard must not be lost sight of. The maintenance of stable exchange rates requires a two-sided process of international adjustment This was what was meant by the "discipline" of the gold standard, or by living up to the "rules of the game." Insistence upon stability and full-employment policies at home should not blind us to this fact, even though we may not be able to foresee just what forms in our own case these adjustments may have to take If we become a large international lender, at short and long term, as seems indispensable, we shall almost certainly at times have to restrain our capital exports, even though to do so may have depressing effects at home Some writers even suggest that to cure the chronic shortage of dollar exchange abroad, which was so much in evidence in the interwar period, we must be prepared not only to increase our imports but even to restrict our merchandise exports

For many countries the process of adjustment will have to include at times fundamental adjustments of their prices and costs to correct persistent deficits in their balance of payments, which brings us back to the British problem of the twenties with which I began As already indicated, currency depreciation is one, but not a satisfactory, way out of this kind of difficulty Some limited use might still be made of it, on some basis of common international consent and subject to safeguarding penalties But it is important to observe that if in general our objective is to have stable exchanges, this decision carries the clear implication that countries must use the price-adjusting rather than the exchange-rate-adjusting method of correction The problem is made more difficult by the fact that the need for this kind of correction of the current balance may be postponed by capital imports, and in a favorable case might conceivably even be avoided altogether, so that there is plenty of temptation to pursue a temporizing policy. One important question to ask of any plan for monetary stabilization is whether it provides adequately for essential price and cost adjustments Some plans that I have seen merely provide that debit balances that have run beyond some period of years should be cancelled Clearly such a method does not solve the problem of basic maladjustments.

This aspect of the problem of how to attain international monetary stability must be all the more insisted upon because so much of the monetary and fiscal theorizing of recent years has been based upon a tendency to accept wage and price rigidities as a *force majeure* That fundamental cost adjustments are feasible was shown by some of the smaller countries in the great depression Sweden reduced wage rates in the building trades, and the Australian government effected a comprehensive reduction of wage rates, interest rates, and other costs as part of a recovery plan which included monetary and fiscal expansionist measures These are countries noted for their liberal economic policies, and the cost adjustment measures were carried through with the support of organized labor With economic interests increasingly being organized into political groups, the great tests of economic policy in the future will probably come on questions of this kind For the United States they will probably arise mainly in connection with the maintenance of internal economic stability But their relation to tariff policy should not be overlooked

With regard to the problems of international trade adjustment, I must confess to some feeling of discouragement Some of the maladjustments have been very deep-seated Between the first and the second World Wars the position of agricultural countries deteriorated steadily It is what Mill would have called a case of reciprocal demand They have wanted our goods much more than we have needed theirs Basically, the difficulty for such countries lies in the inelastic world demand for their products The solution would seem to lie in diversification through industrial development fostered by the import of capital. But this will probably be a long, slow process, and in the meantime another fundamental cause of international maladjustment will probably continue to operate For two decades we have heard much about the chronic world shortage of dollars, which seems attributable to the fact that an advanced industrial country like our own may, through the progressive advance of its technology, enjoy for a long period a cumulative advantage in international trade, despite the supposedly equalizing effects of capital movements Just how solutions are to be found for problems of this character is not easy to perceive, and we should not delude ourselves or these other countries into thinking that monetary mechanisms or even capital movement will supply the whole answer

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[9] See again my 1937 paper referred to above.

I have left to the end what will probably be the chief topic of debate In planning for post-war monetary stability, should we think in terms of the world or of the leading countries? Some of the recent plans are elaborate They call for the establishment of new governmental agencies, in which all countries would be represented, to provide a stable international currency, extend credits, make long-term capital investments, and stabilize commodity markets Difficult questions of sovereignty and of responsibility are involved in all such schemes Will countries really give up enough sovereignty to make such international agencies effective? Is a country's responsibility best seen and fulfilled through the medium of membership in a world body or through direct co-operation with the other countries concerned? Such questions have obviously a much wider application than merely to monetary problems

In the monetary sphere, we may go back for light to what I said earlier about the nineteenth century gold standard It worked through the organization of trade and finance around England as a center and not through the compensatory action of a large number of countries of equal economic weight, as the theory would imply Though this organization has undergone much change, it is still true that stabilization of the leading currencies with reference to each other, combined with co-operation among the countries concerned to promote their own internal stability, would be the best foundation for monetary and economic stability throughout the world

This may be termed the key countries' approach to international monetary stability Small countries have not maintained currency systems of their own but currencies tied to some major monetary unit This fact was clearly demonstrated when England left the gold standard and those countries which had been closely associated with her shifted to the sterling basis. It is also significant to point out that the maintenance of a sterling system did not require the establishment of any special mechanism If, after this war, the dollar, the pound, and other leading currencies could be drawn into a stable arrangement, it seems probable that most other currencies would automatically be covered by it. This is the kind of solution toward which a small beginning was made in the Tripartite Agreement of 1936 between this country, England, and France

One great advantage of this approach, I believe, is that it would help to concentrate attention upon definite major problems instead of leading us to think more vaguely in terms of the world England's situation after the war will be one such problem Her balance of payments is undergoing a fundamental change, which is particularly important for other countries as well as herself because she has played so large a part in world trade and finance She has lost a great part of her foreign assets and much of her trade Her balance of payments is undergoing changes very similar to those which happened to Germany in the last war, and her position after this war may raise questions almost as difficult Some believe that a substantial depreciation of the pound will be essential, while others stress the necessity of retaining exchange control, perhaps for a long period, until fundamental cost adjustments have been made All agree that England will need to exert her best efforts to expanding her export trade Whatever measures are taken, there will be abundant room for conflicts of interest between the British and ourselves Stabilization of the dollar-sterling rate will afford both countries much practice in learning international co-operation, and if achieved, will be of immense help toward general monetary stability

Suggestions of this character sometimes give rise to the charge of bilateralism, which has become, and deservedly, an ugly word But we ought to use it carefully and avoid slogans as a substitute for thought Much depends upon the purpose. An exchange stabilization agreement with England would be no more bilateral in its effects than Mr Hull's reciprocal trade agreements, and like the latter would be intended as a step in a process of achieving greater word stability.

I see no reason either why a plan for monetary stability among the leading countries should not be accompanied by some responsibility upon each of them to promote stability through direct dealings with some of the lesser countries with whom they have specially close relations It would be in conformity with the facts of world organization, political and economic, for England to continue to have special relations with the dominions, or within the sterling area, and for the United States, as in the past, to make direct arrangements with China or Brazil and some of the other Latin American countries. Whether such arrangements were bilateral in a bad sense would depend upon their purpose and the understandings reached among the leading countries Wisely managed, this general method could bring into existence a workable world-wide monetary system

The greatest difficulty at present is to say which, for purposes of monetary stabilization, the leading countries are To draw up a plan merely for this country and Britain could arouse suspicion and invite some counter-bloc We must go farther but don't know as yet just where to go A reconstituted France presumably would be included, as in the Tripartite Agreement, but it may well be a country of much lesser weight than previously The enemy countries could be brought in, presumably, only after some time, and after many decisions had been made about the future character of their economy For *monetary purposes the United Nations do not* entirely square with the conception of key countries, not at any rate until some of them, China for example, have undergone much further development Most interesting and significant is Russia. The war has brought a general awakening to the fact that Russia is to be one of the two or three or four greatest powers in the post-war world But it is still not at all clear what is to be the nature of her monetary and economic relations with the rest of the world, or whether it will be her policy to discuss such questions with others before the war is won. Certainly any plan for future monetary and economic stability must explore as fully as possible our relations with Russia

As I said in beginning this paper, it is probably premature to undertake any precise blueprinting of plans for post-war monetary stability. But it is not too early to be thinking about the nature of the problems involved I will conclude by saying that in all our thinking we must recognize that the United States after this war will occupy a unique position It will be the leading and probably the only important creditor country If we are to have an orderly and stable world, our responsibilities must not be shirked But there is much room for study as to how best these responsibilities can be fulfilled.

SOME THOUGHTS ON POST-WAR PLANNING

HIS EXCELLENCY ALEXANDER LOUDON
The Ambassador of the Netherlands

(*Read February 19, 1943*)

I AM extremely grateful for the opportunity which the American Philosophical Society has granted me to discuss some aspects of the reconstruction problems which the world will face after the war. In this distinguished gathering, which is familiar with the thought of the great philosophers, I need hardly state that the formulation of new conceptions of the organization of state and society by the thinkers of the past has usually only found a beginning of realization after some time had elapsed. Many of the greatest thoughts on human society have never been carried out in practice. In the same manner, several ideals which are now advocated by prominent thinkers of today will probably remain pious wishes for a long time to come. There are, however, certain aspects of a future world organization which are of such a pressing character that no time should be lost in studying them with the greatest care, in order that victory may not find the United Nations unprepared for the task they face. Only a world-wide discussion of the fundamental issues which the peace conference will have to solve can create the basis for a better understanding of common problems. Any one individual can only hope to make a modest contribution to a better understanding of these questions, and I trust that you will consider my address as a personal contribution to thoughts on reconstruction, the realization of which will largely depend upon the conditions actually existing at the moment of the surrender of our enemies. Therefore, many of the details cannot now be adequately discussed but will have to wait until we can visualize the future with greater clarity. Though we cannot at this moment see more than the dim outlines of the coming political organization of the world, there are some basic thoughts which should be formulated. The indispensable foundation for a new and better world must be a complete and total victory of the United Nations. The development of modern communications has forged the world into one unit, in which the traditional ideas of distance and time are rapidly losing their importance. One consequence is that conflicts in any part of the world, however remote they may seem, are bound to have their repercussions elsewhere. The world has become indivisible, and even the most outlying parts can be reached by aeroplane in a few days. No country, large or small, can therefore hope to ignore developments in other parts of the world or to abstain from participating to a certain extent in common rights and responsibilities. A policy of aloofness with regard to international relations, whether it be named neutrality or isolationism, is rapidly becoming obsolete as a means to maintain the security of a country under present conditions. Even if some nations would prefer to revert to these policies and make an attempt to close their houses against outsiders, they would remain in perpetual danger of an invasion which would descend on them with lightning speed. Peace also has become indivisible, and this can only mean that security likewise is indivisible. This general security which alone will enable the world to devote its energies once more to the works of peace can only be achieved by a common and sincere effort of each and every one of the United Nations. This gigantic task can only be undertaken if the responsible statesmen receive the full and unflinching support of the uncounted millions of common people whose lives and happiness are jeopardized by this total war. The price of failure will inevitably be another war.

The task lying ahead of us calls for the complete and sincere co-operation, not of some great powers only, but of all nations which are now united as never before against the totalitarian attackers. The part of each peaceful nation in the common effort will have to be carefully delimited. I believe this to be possible. There are certain facts of political and economical geography which, I think, indicate the way. Each country must be willing to share the burden and to accept its responsibilities with regard to the preservation of peace in that part of the world where its main interests for the preservation of law and order between nations are situated Keeping in mind those political and geographical facts, each peaceful nation should be free to decide in which *part* or *parts* of the globe its main interests call for its participation in the maintenance of peace, provided full acceptance of the ensuing responsibilities be given Let us not forget that even the greatest wars in history have usually started as conflicts of a local nature, which grew into world-wide conflagrations because no international machinery of sufficient authority existed to thwart them effectively before they got out of hand An effective security organization on a regional basis can be counted upon to achieve this This does not mean that all regional changes or revisions should be ruled out For that would be equivalent to creating static conditions and tend to exclude necessary evolutions But those changes or revisions should not be allowed to materialize under threats of force or by aggressions Every nation participating in a regional security organization must be counted upon to make important contributions to the solution of those conflicts which threaten to affect its direct interests, even to the extent of accepting a limitation of traditional rights and privileges. But situations have developed in the past and they may be expected to develop again at some future date, where the combined efforts of the neighboring or regionally interested countries would not be sufficient to check unreasonable claims and threats of an aggressor power In those cases where a conflict threatens to assume such proportions that the regional security organization cannot cope effectively with the problem, other regional security machineries which are not directly involved in the conflict should stand by for action, in order that, if necessary, they may help crush the criminal forces of aggression by the overwhelming power of their united might For such is the logical consequence of the indivisibility of peace that when local anaesthetics are insufficient a major operation will have to be performed

The Netherlands will probably be most willing to participate in such regional organizations for the preservation of peace In the past it has loyally supported all organizations and conventions aiming at the preservation of world peace. However, these lofty objectives had and have failed to assure effectively the security of the country The Netherlands always realized that the degree of security, achieved by participating in international organizations which lacked sufficient military authority to back up their decisions, was to say the least unsatisfactory, as the country in time of strain could only count on its own military strength which, even in extremely favorable circumstances, could never be a match for its powerful neighbors Therefore it can be presumed that the Netherlands will loyally collaborate with an effective organization for regional security because, by participating, her chances of security would indeed be enhanced, if not assured

In this field, the contribution of the Netherlands to the organization of a more secure world is still largely a matter for speculative thought and not in the last place dependent upon the degree of participation of other nations A more concrete contribution towards the organization of a *better* world can be found in its earnest endeavor to cope with what is commonly called the Colonial problem To my mind, it is somewhat misleading to speak of *the* Colonial problem, for this general term covers a variety of problems and a host of situations, each one with its own difficulties and its own merits They cannot be solved by one all-embracing principle or formula Thorough examination and appreciation will prove this to the unbiased mind No one solution will satisfactorily solve all problems, for, moreover, the differences in evolutions and circumstances warrant different solutions The disregard of the results of historical development may well imperil what has been achieved in the past If on one hand it is possible to speak of a common goal, on the other there are various ways to attain it The Netherlands started to tackle this "problem" several decades ago, gently, slowly, I should say, at first, in an increasingly determined and progressive way in the *last* decade We have not been waiting for the war to end to give new impetus and momentum to a solution of this major question In an important speech on the eve of the commemoration of the outbreak of the war with Japan, Queen Wilhelmina indicated the outlines of a Netherlandian plan which of course can only be carried out when the populations in Europe and Asia, which are now under the yoke of the totalitarian aggressors, are free to decide their own future The Queen's speech has clearly indicated certain trends of thought which are based on the historic evolution of the relationship between the different parts of the Netherlands Kingdom in time of peace. The misleading and false propaganda of the totalitarian aggressors which under the guise of a new, enlightened conception of government have reduced the inhabitants to a slavery without parallel in history, made it most timely to recapitulate the evolution of the Kingdom and outline a democratic future organization based on that evolution.

In the total war which has engulfed the whole world, Holland was amongst the first to fall a victim in May 1940. The German occupation interrupted the process of collaboration between the Netherlands and the Indies, which had long passed the era of a purely colonial relationship. Left almost completely to their own resources in a time of unprecedented international complications, the Indies gave magnificent proof that a long period of fruitful collaboration and development had enabled them to stand on their own feet. The realization of the unity and the feeling of kinship developed even more rapidly than it could have in time of peace, and since the Japanese occupation the Indies share fully the distress, agony, and misery wrought by the totalitarian invaders in East and West. Already before the invasion it was realized that the changed circumstances did necessitate a revision of the structure of the Kingdom in order to adapt it to recent developments and modern trends. Extensive preparations have been made to collect material for this discussion in which representatives of all parts of the Kingdom will meet at a round table to take cognizance of each other's opinions. Especially in the Netherlands Indies, detailed material was already collected and forwarded to the Government in London when the invader struck. In the new organization there will be no room for discrimination according to race and nationality, the ability of the individual citizens and the needs of the various groups of the population will determine the policy of the government. In the future commonwealth, the Netherlands, Indonesia, Surinam, and Curaçao will be recognized as the component parts which, while allowing each other complete independence and freedom for the conduct of their internal affairs, will closely collaborate in matters of common concern. A combination of independence and collaboration will give the Kingdom the strength to carry its full responsibility, externally and internally. Such matters of common interest as, for instance, foreign affairs, general defense policy and international economic relations will be decided by some form of common government in which all parts are to be represented in full partnership according to a formula to be agreed upon freely by the populations themselves. The form of this central government will necessarily be decided after the liberation. Certain changes in the four existing constitutional organizations will be necessary, but these reforms will give expression to modern principles of government, while at the same time honoring the historically grown relationship between the different parts of the Kingdom of the Netherlands. Much progress was achieved within the existing framework of the Kingdom by a steady and progressive evolution and by the long and cordial collaboration between the inhabitants of the different parts of the Kingdom. It is to be expected that the coming revision of the constitutional relationship will create a situation in which the possibilities of co-operation and collaboration will increase manifold. The common hardships suffered in the war will have strengthened the tie binding together peoples of different race and creed across oceans and continents. It is generally realized by Indonesian leaders that their nationhood is still in the process of formation and that notwithstanding certain similarities of language, customs, and civilization, the differences among the various groups might endanger their present unity if the impartial stabilizing element of Netherlands influence were suddenly eliminated, or if new and disharmonious elements were introduced. Only by consistently maintaining and developing Indonesian civilization and preserving the roots of native life can this process be brought to a harmonious conclusion. In keeping with the ever changing and evolving trends of government and civilization, the Dutch in the Indies have honestly striven to develop these richly endowed territories by a process of natural evolution of the native culture which was assiduously studied and stimulated by successive generations of administrators. By using the native forms of organization within the frame of the government, it was possible to superimpose new provincial and territorial administrations which brought greater unity among the large number of individual groups and tribes which had no more than incidental relations with each other. The progress of modern civilization has gradually improved the life of the peaceful millions of tillers of the soil who constitute by far the majority of the native population. Moreover, it has been possible to increase constantly the participation of the leading classes of native society in the government. There existed a general understanding on their part of the necessity to co-operate with the Dutch officials for the common good of their native land. The Japanese oppression which has now been inflicted on the inhabitants will only result in a clearer appreciation on their part of the progress which joint Indonesian and Dutch administration has brought. An ever increasing and more intimate collaboration in all fields of human activity provides the best guarantee for the speedy recovery of their peace and happiness. After the war the territories in Europe and overseas can render mutual assistance in the hard and necessary work of reconstruction. To achieve the maximum results also in this field the political realignment will provide a sufficiently large basis for effective and efficient planning. With dogged perseverance and energy the Netherlands and the Netherlands Indies, with their fighting men on land, at sea, and in the air and their merchant marine, are already now fighting side by side under the supreme leadership of H. M. the Queen, and the new bonds forged in times of misery and want will endure.

There is still another topic which I should like to discuss tonight—namely, the highly important problem of economic reconstruction. Certain broad principles of economic reconstruction have been laid down in the Atlantic Charter. Article IV of this historic document says: "They will endeavor, *with due respect for their existing obligations*, to further the enjoyment by all States, great or small, victor or vanquished, of access, on equal terms, to the trade and to the raw materials of the world which are needed for their economic prosperity."

Here I should like to place on record the view of my Government that the highly important aims enunciated in point four of the declaration cannot be attained if considerable exceptions thereto are left in being, and for that reason we express the earnest hope that, desirous as we are to see trade barriers removed and discriminatory treatment in international commerce abolished, a serious common effort be made to that end for the ultimate benefit of all.

For several decades the governmental policy of the Netherlands East Indies with regard to raw materials has been the one of the so-called "open door." Raw materials which it developed in the Indies (and to a lesser extent this also applies to Netherlands Guiana) were available to all nations which needed them for their economic prosperity. The policy of the open door included the admission of foreign capital for the production of raw materials. The open door, however, was not open when the realization not of economic but of political aims was sought. Therefore, when, after the invasion of Holland, Japan exerted great pressure on the Netherlands Government and the administration of the Netherlands Indies in order to obtain more strategic materials than the economic needs of Japan warranted, there was not one moment's hesitation to refuse those demands—and this notwithstanding the very real danger that was involved at a moment when no other nation was in the least committed to come to the assistance of the Netherlands Kingdom should Japan choose to attack. With regard to the past, I therefore dare say that article IV of the Atlantic Charter contains no innovation as far as we are concerned. With reference to the entire Atlantic Charter, I may be permitted to say that while it envisages reconstruction as a whole, reconstruction in my opinion has a twofold meaning. One is the creation of a new worldwide economic organization with the deliberate goal to provide humanity with better living conditions, in which full emphasis should be laid upon the interest of the consumer. The second and narrower meaning of reconstruction must envisage the repair of the actual damages brought about as a direct consequence of war.

So far, the actual destruction wrought by the war is limited in certain occupied countries. The picture may be far different after a war of liberation will have been fought on their territory. Whatever may be the situation, the process of restoring industry and agriculture to peacetime conditions requires far more than the actual rebuilding of ruined houses, plants, and bridges. Everything is so worn out already that clothes are almost beyond the state of mending, new furniture is unavailable and old furniture therefore irreplaceable, fields are exhausted for continued lack of fertilizer, cattle are slaughtered by virtue of the enemy's decrees or through lack of fodder, and all machinery needs replacement or at least a general overhauling and retooling.

Other important things have to be settled in the meantime. The currency system has been disrupted by the enemy in unprecedented proportions. Within two years the Germans have seen fit to double the amount of outstanding Netherlands banknotes, with the exclusive and questionable covering of a German indebtedness to the Netherlands. Meanwhile, so-called costs of occupation have doubled the total outstanding debt of the Netherlands State Not to recognize this new indebtedness would bring no relief, since the only bondholders are Netherlands nationals or Netherlands banks that have been placed under pressure of all kinds to make them subscribe. The latest figures in my possession show that in October 1942, thus after two and a half years of occupation, both the circulation of currency and the national debt continued to rise in the same alarming proportion—unaccompanied, of course, by the creation of any productive power. Generally speaking, even before the necessary currency reform and long before the financial rehabilitation of a nation can be carried out, exchange rates will have to be established I believe it is a foregone conclusion amongst all financial and commercial experts that stable exchange rates are a prerequisite for any scheme of reconstruction.

Through the allocation of the credits for so-called occupation costs and through various other devious ways, the Germans have assumed control of a great many Netherlands enterprises during the occupation They have done exactly the same thing in other industrialized European countries These enterprises have to be de-Germanized, of course In this respect the joint declarations of the United Nations point to the right way This technical problem may prove to be relatively easy to settle, I think, and as far as the Netherlands is concerned, the problem is simplified by the fact that my country had practically no private foreign debts, and no public foreign indebtedness at all. My Government has made ample preparations which can be put into effect almost immediately after the liberation.

The restoration of productive power, on the other hand, is *not* a matter which can be taken care of by relatively simple unilateral measures. Nor is it exclusively a mechanical problem of providing the necessary raw materials, machinery, fertilizer, livestock, and fodder, vast and complicated as this problem is in itself. Except for certain less developed regions, Europe as a whole is a highly industrialized group of countries. Only if its surplus products can be sold elsewhere, in repayment of reconstruction loans and in exchange for the normally required raw materials and foodstuffs, is there any hope to place the whole reconstruction on a sound basis instead of one of charity Of the total population of the Netherlands, for instance, no more than one-fifth is gainfully employed in agriculture Over 40 percent of the active population works in industry, and this industrial production is, in certain lines, vastly in excess of the national requirements In no circumstances can the farmers support all the inhabitants with their products Agriculture as it was practiced in the Netherlands was highly specialized, particular stress being laid on the production of dairy products, vegetables, and horticultural products for the needs of the highly industrialized regions of Holland and also of the neighboring countries An important part of the yearly needs of fodder, chicken food, and fertilizer had to be brought in from abroad

With regard to industry, similar relations existed Holland had to rely mostly on foreign and sometimes overseas raw materials and half-finished goods. In many instances mechanical equipment had to be imported from abroad--often from this country. The Netherlands also have to import a great many consumption goods such as oranges, coffee, tea, and a host of other articles. In conclusion it should be said that loyal and sincere co-operation to put in effect the basic principles of the Atlantic Charter is vital for reconstruction in both meanings of the word. The well-known vicious circle of the depression years will have to be broken when we begin rebuilding the world.

Since we will start almost from scrap, in the most literal sense of the word, and since in the first years of reconstruction the potential needs will be far greater than the available production of goods, it should not be too difficult to break that circle The present co-operation of practically all the nations of the earth will offer great possibilities at the moment of our victory The peace will have to be made binding for the entire world. One single exception may prove to be fatal for the entire structure.

The above will have given some indication of the nature of the complicated and urgent problems which will call for a solution in each of the United Nations at the end of the war

Countries like Holland and the Netherlands East Indies, just as all countries which have suffered the consequences of a merciless occupation and exploitation by a ruthless foe, will need all their energies to take in hand the urgently needed work of reconstruction Aside from the individual problems of reconstruction and reorganization which will face each of the United Nations after the war, they will have an extremely difficult problem in common, namely, the procedure to follow with regard to the enemy countries There will be a natural tendency to devote all attention to the immediate problems which each individual state of the United Nations will face at home, but it would be extremely dangerous if the Allies of today should fail to adopt a realistic attitude with regard to Germany and Japan Disregard of the mentality and the past policies of the totalitarian powers entails another relapse into the attitude of indifference and the danger of still another world conflagration Therefore it seems essential that Germany and Japan be put under the supervision if not the control of the United Nations The superhuman efforts made in time of war will be in vain if the same unity of purpose, which now exists in the face of the supreme danger to our civilization, weakens when the danger is past It would be a fallacy to pretend that a military defeat is sufficient to cure the totalitarian powers of their dangerous idiosyncrasies Only a slow and patient process of re-education can restore these countries to normal relations with their neighbors and international society The task which lies ahead of the United Nations here is certainly most complicated and thankless, but it must be undertaken Different methods have been advocated to regenerate Germany and Japan Some have proposed that Germany be split up into a federation of states, where Prussianism, that scourge of humanity, would be kept in check by a combination of other groups. There is general agreement that the military power of Germany must be broken, but there is less agreement on the economic measures which will be necessary to prevent her industrial potential being again abused for military purposes It will be necessary to undertake a process of re-education of a large portion of the population which has lost its independent judgment in the long years of Nazi domination and before that of Prussianization At times the problems facing the United Nations in this respect seem almost impossible to solve Therefore it is clear that Germany cannot be left to solve her problems alone, but on the other hand economic discontent and misery will inevitably generate feelings of the same nature as those which were the fertile soil on which Hitlerism could develop This problem affects all United Nations, but it will be understood that the territorial neighbors of Germany, who have lived so long under the menace of her overwhelming military machine have a very special interest in the solution These countries realize that at the peace conference special demands will probably be made upon them by the other Allies to help in the re-establishment of a civilized Germany in a reconstructed Europe Allied military forces will have to police Germany for a considerable time, the accumulated loot from the occupied countries of Europe will have to be returned to the rightful owners, the punishment of war criminals will have to be enforced. All of this will cause a considerable demand for specialized personnel familiar with German problems and peculiarities. It is clear that the neighbor countries where knowledge of the language and organization of Germany is fairly common will be called on to supply a part of this personnel. There is still another reason why the countries which surround Germany will gladly accept participation in the work of reconstruction Whatever solution may be adopted, it must be borne in mind that the European continent will always remain more or less economically dependent on a large territory in the center of Europe commonly called Germany Belgians, Poles, Czechs, and Netherlanders certainly cannot be accused of cherishing friendly feelings towards a nation which has ruthlessly destroyed the peaceful work of generations, but they all realize that a hungry and impoverished Germany will remain a permanent danger even after a military defeat. They can be counted on to spare no efforts to transform Germany into a peaceful and prosperous country which ultimately can participate on a basis of complete equality in the exchange of goods and services necessary to increase the prosperity and happiness of mankind, and can finally be admitted as an equal into the family of nations.

A very special problem, to which I should like to draw your attention tonight, is that of Germany's industry It is of obvious importance to all of us, since now more than ever the industrial capacity of a country is the main basis for its war effort. How then are we to see to it that Germany will be in no position to mobilize her powerful industry once more for aggression?

Rearmament, we all know, takes years even in highly industrialized countries. In Germany, the preparations for the present war have taken seven years—and I merely count the years of the most active preparation. Therefore, I think that only through the establishment of a firm grip of the state on all industrial activity will it be possible to bring about such rearmament. Hence the control of German industry, whether privately or publicly owned and including public utilities, is the pivot which must be in safe hands. Would it not be relatively easy to place this control in the trusteeship of an international co-operative body in which the majority of the capital stock of the German corporations would be vested? This body of trustees need not interfere in the everyday German life, except in a sense which I will explain, and which will be beneficial to the average German worker. Only with such control of its production apparatus firmly in international trust may we be sure that Germany cannot prepare future aggressions. As I see it, the body of trustees should be empowered to market the German industrial products abroad, thereby creating stable employment conditions with consequent flourishing home markets. It is likely that, with the business control in international hands, the appreciation abroad of justified German foreign trade needs will be greater, particularly so since German trade relations will then no longer be followed by German aggressions, nor could trade be used again as a means of political pressure.

I shall not work out in too much detail this trusteeship over the German industries, but I will merely outline the policy which I think the trustees would have to follow. These trustees might be composed of statesmen and business men of the United Nations, the latter without actual ties with similar business in their own countries. The shares to be placed in trust might be computed to each nation on the basis of its claims against Germany. The United States would have, besides its direct claim, a great indirect claim as a consequence of the Lend-Lease help given to the Allied warfare, Britain would have a substantial claim with regard to the damage done by German bombings and the very high costs of three and a half years of active warfare, Poland, France, Holland, and the other occupied nations would have their own important claims based on occupation costs and other actual damage done. The total of these claims will possibly be so enormous as to exceed even the total capital value of the German incorporated industry, mining, and shipping.

The main policy of the trustees would not be primarily the financial reimbursements of all these costs—although these costs give full moral justification to the seizure of the capital stock in question—but rather the supervision of the whole German Industry so that no new rearmaments can take place and so that, on the other hand, fair labor standards will prevail. If these standards are better than under the Nazis, I doubt whether the German workers will feel unhappy about the changes. The business policy as a whole can be one of moderate profits, which may initially be used for the further relief of the most stricken areas of Europe, and in the course of time alleviate the taxpayers abroad, overburdened by the cost of war resulting from German aggression. No new capital issues, no shares nor bonds, would be offered to the German public unless the trustees obtained at least 51 percent of them. Meanwhile, it is my sincere hope that the whole educational system of Germany will be radically altered and made in harmony with the Christian religion and the principles of democracy. If such a change takes place and has time to influence the two next generations, then the task of the trustees might be considered finished. In the meantime, with all safeguards firmly in our hands—an adequate international police force amongst them—we shall be in a position to let Germany resolve its own education problems. Any imposed system would be most unwelcome, to say the least, and it would never bear fruit. The industrial control, on the other hand, could insure work for all and bring good working conditions for the labor classes, whereas it would lead to a minimum of interference with German domestic life. It would save the world from the recurrence of the all too frequent menaces to Western civilization which have originated from the German mind, helped by the German industry.

The future of Japan presents some special characteristics which I will not discuss in detail, but the fundamental problem is identical. Only an earthquake of far greater violence than previously recorded could succeed in eliminating completely the group of islands which have menaced the safety and security of the millions of inhabitants of Asia. The measures taken to assure a peaceful participation of Japan in a future world will have to be carried out mainly by the powers interested in the Pacific. Generally speaking, all territories which have been the victims of Japanese insatiable lust for power and domination will demand participation in the reorganization of the Pacific area I sincerely hope that the progress which has been made in recent years towards a better understanding of the justified demands of the inhabitants of the tropical regions will facilitate a solution which satisfies the innate sense of justice of world opinion, which ultimately is responsible for the realization of the great ideals which have made possible the advance of human civilization

MONEY AND SOVEREIGNTY

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THE Western World inherited from the Roman World a lasting sense of dualism. Upon its old tribalism had been grafted a new universalism, and there is a kind of ultimate coincidence that just as the political unity of the Western Empire was atomizing under the intrusion of the barbarian tribes, it should have been given St. Augustine's *De Civitate Dei*, with its vision of a universalism as wide as mankind. From that time our world, like Faust, has been continuously torn between two natures—between its sense of tribal particularism, and its sense of ecumenical universalism. At periods these two have resolved their conflict, at other periods the conflict has seemed beyond resolution. But even during these latter periods, the conflict itself has been evidence of a persisting will to solution. The story of this conflict is one aspect of the history of sovereignty.

On two recognizable occasions this principle of universalism has taken a form sufficiently tangible to be defined as a world order—that is, an entity having a geographical boundary, a physical center, a hierarchy of organization, and a capacity for conferring upon its members, in their quality as members, certain rights which were acknowledged by political sovereignty. In neither case did this so-called world order cover the entire globe, or a majority of the human race. Furthermore, the term "order" (in contrast, let us say, with the word "organization" or the German "Ordnung") implies a moral authority deriving its powers conspicuously from the consent of the governed. To acquire this authority, an order must reflect the *communis sensus* of its members so completely that resistance is not unlawful, but unthinkable, and that the recalcitrant is not regarded as a law-breaker, but *hostis humani generis*—a term whose very language displays the antiquity of the idea of universalism, of the solidarity of the race.

In the instances to be cited, the constraint enforced within the order has been a moral constraint. Resistance to a moral order is its own penalty of exclusion from the order, as the punishment of Faust was simply the fulfillment of his own will.

But political power, whether particular or universal, is only one aspect of human life. It operates in the presence of other social activities, among them the economic, and the relation between the political and the economic—sometimes called political economy—undergoes continuous change. For the purposes of this paper, we shall consider only *one* element of economic life, the monetary; and we shall briefly sketch the part played by money in the relation between the idea of universalism and that concept of political particularism commonly called sovereignty.

Few clichés are more false than the statement that the world is growing smaller. Our mechanical ingenuity has outrun our intellectual development, and the mere reiteration of outlandish geographical names over the radio by no means insures that those names become part of our consciousness. Rather, left to itself, it offers the probability that we shall fill those names with populations created in our own image, and having little resemblance to the actual inhabitants. But it is not left to itself. In this enlarged world, the individual is obliged to form judgments upon subjects concerning which he lacks even that degree of acquaintance that would form opinions. It is not coincidence that this period of the enlarging world has seen the rise of propaganda and its inevitable counterpart, censorship, as recognized instrumentalities of sovereignty. Created in war, they were not generally demobilized in peace, and further magnified in the present struggle, they are now, in a variety of forms, familiar concepts of organized society.

As a matter of fact, our world is becoming embarrassingly larger. When Christendom was the world order, it occupied but the tip of the Eurasian peninsula, and the inhabitant of England could correctly visualize the whole of Christendom as it was mirrored in his own hamlet. The patterns of medieval feudalism repeated themselves from Hadrian's Wall to the Strait of Messina. In the larger world order of the nineteenth century it was the standing astonishment of the American tourist that Europe looked just like "back home," except that it had bigger and better ruins. Even this was denied by a traveler recently from the San Francisco fire. And this homogeneity of physical aspect was attended by a homogeneity of political, cultural, and economic institutions, attitudes, and aspirations.

But of this larger world, of which we are now a part, it is not true. As the world widens it becomes increasingly difficult to discover, not the elements of homogeneity, but common denominators of heterogeneity. The easy way out of this dilemma is to impute to the absentee attitudes and definitions assimilated to our own, to endow his institutions with names not translated from his, but fondly paraphrased from ours, and utterly alien to his experience. When we endeavor to visualize the problems of the post-war world as they will exhibit the relations of money to sovereignty and of sovereignty to money, and as both relate to the general questions of particularism and universalism, it is apparent that the terms themselves, as well as their background, are very different from those of 1919, as those of 1919 were different from those of 1815.

With reference to universalism, the memory of a former universalism haunted Vienna in 1815 sufficiently to provide the nomenclature, if not the substance, of the Holy Alliance, but no memory of a universal church is part of the tradition of those who will speak for Russia, China, or Japan at the peace table. In 1919 such a phrase as "the law of nature and of Nature's God" might still echo faintly through the corridors of Versailles, and the recollection of the universalism of the nineteenth century gold standard was a living and happy memory. But to what tradition of universalism—religious, moral, or monetary—can its proponents now claim allegiance on the ground that it is and has been acknowledged *semper, et ubique et ab omnibus?*

With reference to political particularism, whether under the abstraction of sovereignty or the concretion of the "state," the terms mean one thing to an American brought up in the tradition of Rousseau and Jefferson, another to a German educated in the school of Fichte and Hegel, and something quite different to a Russian or Chinese whose ideology traces to philosophers whose very names are unfamiliar to us.

Yet, out of this heterogeneity may appear, perhaps, some common denominator of understanding which will define particularism and universalism, or define the state in its external aspects with sufficient clarity and sufficient acceptability to provide at its maximum a world order, or, at its mean, a *modus vivendi* of international intercourse, or at its minimum—and against the background of the thirties this minimum may seem utopian—a kind of international or interregional code duello, analogous to Grotius' Laws of War.

Rather than attempting at this moment to conjecture the name under which post-war universalism may come into being, it may be useful to indicate certain specific problems, upon the answer to which will depend the future relations of political particularism and universalism.

Not all of these relations are economic. Indeed, most of the historic examples of universalism have had a spiritual rather than material focus. The Hellenic World was, within its confines, a true world order. In the fiercest periods of the Peloponnesian War, which in microcosm was the prototype of the present world war, no Greek could be prevented from going to the Olympic ceremonies by the fact of war. His Hellenism—the sole fact that he was a Greek—was recognized as a valid and overriding passport.

Beyond doubt, the clearest example of a contemporary world order is the Dar-ul-Islam, literally the World of Faith. In the Dar-ul-Islam, one collective word described citizenship in this world—a Moslem may be a Berber from Morocco or a Malay from Sulu, but if the Malay from Sulu goes to Morocco, or the Berber from Morocco goes to Sulu Archipelago, he carries with him his individual status as a Moslem, and with it certain tangible obligations and prerogatives.

Neither of these examples throws much light upon the prerequisites of any form of universalism which concerns itself with economic life, but they do throw some light upon the distinction between a world order and other forms of world organization. In the examples cited, the world order conferred its membership directly upon individuals and those individuals could then assert the quality of their membership against the state and find the assertion valid The Greek could attend the ceremonies at Olympia not because he was an Athenian or a Spartan, but because he was a Greek. An individual had the freedom of Christendom, not because he was a Frank, or a Venetian, or an Englishman, but because he was a Catholic A Moslem has the freedom of the World of Faith, not because he is an Egyptian or an Iraqui, but because he is a Moslem In Grotius' time a ship claimed the freedom of the seas not because it was a Dutch ship, but because it was a ship

The nature and the quality of membership in the pecuniary World Order of the nineteenth century illustrates this point Since the world order of the nineteenth century was exclusively a pecuniary order, the only suprasovereign freedom it could confer upon its members was a pecuniary freedom It could not confer freedom of universal movement upon the persons of its members, nor even upon their goods, it could confer it upon their money. While as a matter of fact persons did move freely about the world in that period, and goods relatively freely, there were only two freedoms that could be claimed as a matter of acknowledged right—the freedom of the seas, which had been promulgated by Grotius, and the freedom of the movement of money In this pecuniary world order, the freedom of the exchanges was the sole counterpart of the freedom of the seas, and together they represented tangibly the universalism of the period—rights that could be asserted against, and were acknowledged by, the state, even though they were in derogation of historic definitions of sovereignty that had been recognized before, and have been recognized since They were established rights inherent in individuals not in their quality of British subjects or American citizens, but in their individual quality as members of the order But membership, while individual, was impersonal—it was not the owner who had the freedom of the order, it was his money or his ship

This concept, while taken quite as a matter of course in the nineteenth century, is strongly at variance with the contemporary theory of sovereignty, and of the relation of the state to the individual. Nothing more clearly indicates the change than the passport regulations In the pre-1914 world the individual travelled at his own will from country to country upon his lawful occasions, in the post-1918 world, with few exceptions, he was required to ask permission of his own government before he could leave his country, and to secure a permission of entry from the government of the country he intended to visit What had been a sort of prescriptive right of man as a citizen of the world became a privilege granted to the man as a citizen of a particular state, and the fact that the privilege was in most countries (but not all) rarely refused somewhat obscured a radical change of status

Conforming to this change in attitudes, the contemporary concepts of universalism do not look in the direction of a world order which would confer upon individuals a membership which, in their quality as members, would give them certain rights against, but acknowledged by, the state They rather look in the direction of an organization of states in which the international relation of individual to individual would be determined not by their quality of common humanity, but by their quality as citizens or subjects of different states Indeed, it is quite possible to imagine that individuals would be entirely excluded from international relations and that international relations, commercial and pecuniary, would be limited to states or agencies of the state Such an evolution was suggested more than two generations ago by the lively pen of Robert Louis Stevenson, who contemplated the prospect with Victorian apprehension

But whether we suppose that international relations take the form of pecuniary transactions between individuals or between states, and whether we suppose that the post-war world organization is composed of a multiplicity of states, or of a few pluralistic monetary areas, it presents a problem as it relates to the relations of money and sovereignty Pecuniary intercourse—and it is difficult to imagine commercial intercourse exclusively on a barter basis—presumes among the membership a common attitude toward money, as money crosses the respective boundaries This attitude is related to a particular aspect of money, namely its price in terms of itself—that is, a mutual understanding or meeting of minds as to the nature, determinant, and function of the rate of exchange, and the nature, determinant, and function of the rate of interest

In the Western World, interest was, by nature, money received for the use of money, its rate was a price, determined by supply and demand in a free market. Its historic function was to provide the device by which the surplus of the going concern became available for the expansion of concerns not yet going, and by which the surplus of employed individuals became available for hiring the employable This was the device by which that particular social or economic function was performed within the money economy of the Western World generally over a long time It is not, of course, the sole device by which this function can be performed The U S S R has a money economy, but it does not utilize the interest rate as its mechanism for capturing and canalizing these surpluses The whole concept has long been disputed by a line of German theorists from List to Knapp, whose gospel was carried to the Western World by Lord Keynes Neither wholly accepted, nor wholly rejected, it left Western thinking extremely confused, for without abandoning certain premises as to the nature of interest, it took the determination of the rate from the market and passed it to the hands of the state, without formally relieving it of its historic function Whether the doctrines were good or bad is less important than the fact that their partial application made it impossible for interest to perform its historic function and their partial acceptance cast the odium of failure upon the institution But, to compound the confusion, no two states west of Russia exhibited a common degree of acceptance or application, and in all there was considerable disparity between doctrine and practice If we imagine a post-war organization, some members of which delegate this function to the interest rate and some to a radically different device, this very fact would exercise considerable influence upon the nature and scope of the organization

The same difficulty presents itself in the matter of the exchanges In American experience, we have been accustomed to think of the rate of exchange as an equation of two currencies determined in a market, equally open to buyers and sellers, for the purpose of transferring a claim on value Neither the personality of the transactors nor the object of the transactions were relevant to the transaction itself Such a description is by no means comprehensive Even before the war, it was no uncommon thing for states to regard both the personalities and the objects of the transaction as matters of concern, and, in lieu of a single rate established in a market and applicable to all transactions, to offer a variety of differing rates, each applied to a type of transaction which the state wished to encourage or discourage. Some states determined their rates of exchange as mechanisms to promote exports, others as mechanisms to induce imports, the differential being, on occasion, absorbed by an export subsidy in one case and a kind of forced loan in the other In the external commercial relations of the U S S. R no rate of exchange for the ruble figured in the transaction, the rate of exchange having no more than a minor function applicable to a limited number of dealings In short, states had exchange policies as they had formerly had tariff policies, with the rather important difference that the tariff policy was usually a matter of legislation, while the exchange policy was usually a matter of administrative action In candor, we must suppose that each state, in formulating its own attitude, took action which prudent officials regarded as necessary or expedient to its own welfare, but the result was a net increase in the already ample number of international frictions The exchange rate had become an accepted device of economic warfare One could say that scarcely two of the major nations of the world were in agreement as to the nature, determinant, or function of the rate of exchange, when in 1939 war resolved this problem, as it did many others, by simply deferring it

Yet, the nature, determinant, and function of the rate of exchange must be a matter of common attitude within any world organization that contemplates money transactions As in the case of interest, this involves a clear and acknowledged definition of sovereignty and its limitations To take a simple example if the Beveridge Plan had been proposed in the nineteenth century, and had been opposed convincingly by the argument that its acceptance would take England "off the gold standard," the plan would undoubtedly have been rejected It would have been vetoed by the bankers, not in their professional capacity as ogres, but in their functional capacity as the national custodians of a world order Their verdict would have been accepted by the British people as consonant with the obligations of membership in the then world order, and some alternative scheme would have been sought. It is not easy to imagine that England would reject such a plan now solely because an international committee argued that its acceptance would cause uncertainty as to the exchange value of the pound in terms of Russian rubles or American dollars. Yet a decline in the pound in terms of the dollar has had in the past, and might have in the future, as its direct consequence, the transfer of a pecuniary problem from the British workman to the American and Canadian farmer, or, alternately, from the British Exchequer to the American Treasury We have forgotten the genuine consternation in this country when in early 1939 the British pound dropped to $4 60 and later to $4 00, because both the murmurs of anxiety and the half-uttered threats of "retaliation" were silenced by the tumult of war Yet in some future time of peace a similar question could readily arise, requiring for its solution a common attitude on the nature, determinant, and function of the rate of exchange, and this common attitude neither exists at present, nor has it been outlined for the future

In the absence of a common, world-wide formula as to the nature, determinant, and function of the price of money in terms of itself, it is not difficult to imagine that an international organization could be established which would take jurisdiction over these matters, and would exercise this jurisdiction both with a disinterested mind and with scientific jurisprudence It is not too difficult to imagine such an organization being endowed with a certain capacity to enforce its decisions Disraeli remarked that one can govern only by force or prestige, and this can be applied to any discipline Punitive sanctions applied to a sovereign member invite withdrawal, if it regards the discipline as more onerous than ostracism On the other hand, prestige is a plant of tedious growth and tender nurture But in the last analysis, international organizations, like other forms of government, depend upon the consent of the governed - that is, upon the existence of a *communis sensus*, or a common attitude toward both the end and the means

In the post-Versailles world the problem of sovereignty, as it related to money, referred to some three-score or more national states familiar with a certain tradition and eager to return to it It was this concurrence of tradition and aspiration that provided a common accord as to the validity of the end and the utility of the means After this present war, the *dramatis personae* of this problem play may be equally numerous, or they may be no more than a handful of monetary areas or blocks These may well be in substantial accord as to the nature and the validity of the ends to be sought Indeed, it is rarely difficult to formulate objectives in terms that command unanimous assent The difficulty begins when it becomes necessary to devise the means to the ends, which, commonly enough, means a redefinition of ends in terms of the means to be employed It is then that one encounters the characteristic divisions of mankind—the conservative with his unscriptural insistence upon putting new wine in old bottles, and the liberal with his confident assurance that if new bottles are provided, they will spontaneously fill themselves with the potent elixirs indicated by the labels

But ends are realized only through means, and it is with means that a world organization must concern itself—means for resolving the rather stuffy and meticulous problems of the relation of a shiny abstraction called sovereignty with such dull abstractions as the price of money in terms of exchange and interest

THE SMALL NATIONS IN THE POST-WAR WORLD

HALVDAN KOHT

Norwegian Minister of Foreign Affairs, 1935-1941

(Read February 20, 1943)

THE first World War of the twentieth century was essentially a war between Great Powers In the present World War many more small nations are drawn in, and it is, to a much larger extent than the previous one, a war of ideas, a clash between opposite conceptions of the life and the rights of nations On the part of the United Nations we all fight for freedom The small nations, however, do it in a fuller sense of its meaning than most of the big nations, because they fight not only for their own freedom but even for their liberation, as so many of them have had their countries invaded and occupied by aggressor and oppressor nations By reason of the origin of this war one may be largely justified in saying that most directly it is fought for the freedom of the small nations

In view of such facts it must appear surprising and even strange that, within the United Nations and more specifically in the United States, plans have been suggested for the abolition of the independent small nations, either—where it seems possible—by combining them into larger units, or by distributing them between the existing Great Powers, in some cases cutting them into pieces for this purpose, thus destroying all historic unities Obviously such plans would not be apt to inspire the small nations with any enthusiasm for fighting this war to victory They know that a victory of Hitler would annihilate their independence and leave them in perpetual slavery But if they might be led to think that even a victory of the Allies would have almost the same effect, why should they fight? And we have to acknowledge that the small nations play a not unimportant part in the fight of the Allies So, merely from the viewpoint of the actual warfare, such plans would appear inconsiderate and disastrous.

In a broader view, considering the future of humanity, ideas of that order present themselves as founded on quite superficial notions of national and international relations It is easy to sit down before a map and draw new frontiers of nations with compass and ruler. But it is a different matter to cut into living bodies and distribute their limbs according to what you might think should have been the rational arrangement Geography is not everything in the life of nations. The real life is in the growth of common institutions and traditions, very often breaking and crossing what military geography might call "natural" frontiers.

When an American, living in this vast country, looks at Europe, which, though only a mere trifle larger in extent, is divided into so many independent states, he may become impatient at such dismemberment, and he may think Over here we have established national unity and solid peace in an immense area and for a hundred and thirty million people (though he might add · only since less than eighty years)—could not those silly Europeans follow our example? Everybody will admit that the United States is a glorious example But looking at it a little more closely, we quickly discover many anomalies, which a rational geographer might wish to even out I feel sure, however, that the people of Rhode Island or Connecticut would protest passionately against having their states incorporated for instance in Massachusetts or New York, and there are in this great Union states with a much smaller population than in any state of Europe Passing outside the United States to other parts of America, we find many small nations in Latin America, and I vividly recall the scorn recently evoked in this country by the disclosure of Nazi plans to reconstruct South America so as to arrange it in some few large states

I would not take all such plans or suggestions too seriously, but I want to assert most strongly that a realistic view of the future can never push aside the factual conditions created by centuries of history All plans of the future that will have any chance of stability must build upon the foundations of past and present. And the small nations, in Europe as well as or even still more than in America, form an element of life which, in fact, is an asset and not a danger to the stabilization of universal peace

Nobody can seriously disagree with the propo-

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sition that the chief aim of our common efforts after this war will be to organize the world so as to prevent all new aggressions and military conflicts. If we shall be able to form an intelligent opinion of the role of the small nations in such an organization, it is necessary to keep before our eyes what attitude they have taken toward this question in previous years. And I think I may state quite briefly that no governments have been so anxious to establish an international order of justice as those of the small nations

I may recall that the Parliament of Norway was the first one to declare itself in favor of general and obligatory arbitration treaties (in 1890) I may recall that, during the former World War, the initiative came from Holland for elaborating a complete program of a League of Nations Within the League of Nations, the group of the Scandinavian and Netherland delegations, representing seven independent nations, often called the Oslo Group, were the most consistent champions of putting into practice the ideals of the League It was the great Swedish statesman Branting who made himself the spokesman of the League when, in the Italian-Greek (Corfu) incident of 1923, the Great Powers left it in the lurch The great Norwegian Nansen took the helm after him You could not imagine better leaders of international co-operation for peace

I remember, not without pain, that after the outbreak of the present war, newspaper editors and other representatives of the two allied Western Powers of Europe threw blame upon the small nations for having betrayed their ideals and those of the League by not lining up resolutely on the side of the Allies I shall not discuss here whether they ought to have done so or not In this connection it will suffice to state that the reason why they acted as they did was simply that, in advance, the Great Powers had betrayed their duties according to the League rules and thus forfeited the confidence of the small nations

There is no need of recapitulating here the sorry story of the Manchukuo incident, the Ethiopian adventure, or the Japanese invasion of China. I shall only recall that, as a conclusion of all those events, the British Prime Minister Neville Chamberlain explicitly declared in the House of Commons in February, 1938, that no small nations might imagine that they would be protected by the League against aggression, they would be deluded if they acted upon such an expectation Less than three weeks after this speech, Hitler invaded Austria without the slightest interference from the League powers Half a year later, the same powers directly assented to the dismemberment of Czechoslovakia, although one of them had a specific treaty obligation to defend the unfortunate country After another half year Hitler was allowed to occupy the rest of Czechoslovakia And the same French Minister of Foreign Affairs, M Bonnet, who, on the day following Hitler's march into Prague, assured me that from now on he regarded war with Germany inevitable, only seven weeks later, in the beginning of May, 1939, made one of his official spokesmen tell the press that the Government of France was "lukewarm" to the idea of a general guarantee to the small nations an idea at that time suggested by Russia How was it possible that the small nations might preserve any kind of trust in governments that acted and spoke in such a way?

The present war has been a lesson to the Great Powers still more than to the small nations It has finally demonstrated to them that the maintenance of international law, the sacredness of treaties, the defense of freedom are more indispensable elements of their own existence than the most cunning and clever power politics That was an experience that had impressed itself at an earlier time on the small nations Of course, what I have said about the struggle of small nations for international justice does not imply any conception of their being by nature more virtuous and wise than governments or citizens of big nations Simply, their very weakness compelled them to grasp and embrace the ideal of international organization under the rule of law as the only solid shield of their life.

About sixty years ago a British statesman, Lord Salisbury, said that we live in an age in which the big nations tend to become ever bigger, the small nations ever smaller. Since that time many new small nations rose to independence, apparently contradicting this prophecy Nevertheless it was true in the sense that the small nations have become ever more powerless in the world of rival powers One of the reasons for this situation is simply a technical or economic one Military equipment has assumed such an enormous development as to make it financially impossible for the small nations to keep up an armament that can match that of the big nations They would be completely ruined if they tried to There is no rescue for them but the establishment of international laws that might prevent aggression They themselves can have no hope or temptation of conquering foreign land, if they planned to imitate great powers, as one or another of them may have tried to, they would be pitifully defeated and crushed Indeed, they have learned, sometimes by hard experience, that international organization is the only possible defense of national freedom Therefore, if such organization may be achieved, it can have no more reliable friends and supporters than the small nations Why should anybody aim at destroying them?

Recently a prominent American educator proclaimed as his program of international co-operation that "nationalism" should be broken down "as the enemy of an all embracing democratic faith" Now nationalism is a very vague word, apt to convey various notions If you conceive of it as meaning national selfishness, isolationism, or even hostility toward others, then, of course, it is to be combated by all progressive forces In that sense it is the remnant of a barbaric age, contrary to the ideas of higher civilization Generally, however, this is a brand of nationalism that nowadays is living and thriving only in the great military nations Beside such nationalism, modern development has fostered a national mind of much higher value, which tends to replace, and in the highest civilized nations mostly has replaced, the more primitive features of national thought That is the profound feeling of solidarity, founded upon a unity of historical traditions, of common institutions and struggles, of social and intellectual co-operation It is the moral unity of citizens who feel personally responsible for one another and for their country and, therefore, think of the interests of the nation as their own interests Such a mentality is the fundamental strength of a nation, an essential element of its existence, a condition of its growth as a living unit, and, in the last resort, its best contribution to humanity

The great Norwegian historian J E Sars, the first historian who undertook to offer a complete synthesis of the basic forces through all the changing stages of Norwegian development, at the same time throwing much light on general aspects of historical evolution, intended to show how the people of Norway had grown to be a national individuality in her own right, socially and therefore mentally different from the neighboring nations His work was an eminent study on the law of differentiation, such as manifested itself in the history of nations He did not supplement his study with research into the effects of the law of integration which, also, is acting forcefully in the development of nations, binding them together across all individualization In fact, in all history there is a double current perpetually running, one of separating people, multiplying differences, the other of unifying and organizing Many observers think of the two tendencies as opposite and hostile to one another, and, at different times, their mutual strength may be changing But both of them are there, always active, and virtually they go parallel, even co-operating

It is almost unnecessary to mention, as it is a fact obvious to everybody who will see, that history has at the same time produced a rich variety of distinct individuals and an ever more complex social organization But it may be worth while to point out in particular how superior and subordinate elements of organization have gone on developing concurrently In the United States you can observe clearly how the public activities of the national government and legislation have increased immensely during the whole history of the Union, and many people have been afraid of a diminution of the individual states There can be no doubt, however, that at the same time the tasks and the activities of the states have also gone on steadily multiplying And, again, within the states, those of the cities and the townships have increased correspondingly Such is the development in other countries too The same forces have stimulated local as well as national activity and organization In other words, increasing centralization does not necessarily kill the organs of local life At any rate, that holds true in democratic societies The craze for conformity belongs to the age of despotism

These observations may give us some guidance for the planning of international organization Indeed, the American example, without inviting slavish imitation, has been an inspiring fact in the aspirations and efforts of many small nations, and at this time they are ready and happy to follow Anglo-American leadership, because, in spite of all previous disappointments, they have convinced themselves that both British and Americans will respect and assert the principle of freedom within organization Perhaps no other nation in Europe feels in all its ways so closely attached to the English-speaking world as does Norway, but to all of them it was a hard blow for their hopes of a better future when the United States failed to join in the first attempt to establish a League of Nations Undoubtedly, for the practical action of the League, it was a fundamental defect that the United States remained out of it because, in that way, the only great power that was not vitally interested in power politics came to lose its influence in the activities of the League Still more it was a moral blow, deeply felt by all the small nations Now they entertain more confidence since the United States is one of the leading powers among the United Nations

At the same time they believe that the ideas of freedom that always have been strong in the British Commonwealth have now won so complete a superiority there as to keep down all kinds of imperialism As to Russia I want to say that in my country we never have had any fear of aggression from that side, and generally it must be observed that within the Union of Soviet Republics the traditions and the languages of the different nationalities are respected and maintained to an extraordinary extent It may be argued that the policies of the Soviet Union in regard to the small Baltic States in the fall of 1939 and the spring of 1940 seem to testify to an imperialism that would not promise very well for the future On the other hand, however, it must be recalled that, before entering upon the way of military occupation, the Soviet Government had tried to urge upon Great Britain a common British-Russian guarantee of the independence of the Baltic States, evidently and professedly because the Soviet feared that these lands might be used by Germany as springboards for an attack If this fear could be removed, the Soviet policies might possibly change, and I should wish they would Anyhow, I dare presume that Soviet imperialism, which essentially has a defensive character, never might go farther than securing the Russian homeland against foreign invasion Everything considered, I think the small nations may well be justified in concluding that a new League of Nations, in which the named great powers would be leading, will truly serve the protection of their freedom, not the oppression of them

The value as well as the efficiency of a universal co-ordination of the nations will largely depend on how it manages to establish harmony between the two ideas of freedom and of organization Obviously, no more than in the relationship between free individuals and organized society, can freedom of the nations be conceived as the right of arbitrary action in matters regarding others The commonwealth of nations must be governed by international law This may seem a truism, but it is too often disavowed both in practice and in theory, the governments or the jurists of the particular nations refusing to accept certain obligations on the plea of their sovereignty being involved Thus, for instance, in most treaties of international arbitration questions regarding national honor or vital interests are excepted For the success of a new league of nations it will be better to avoid all idle theoretical discussions about the implications of sovereignty As a matter of fact, all nations have accepted restrictions, at least temporary, of their sovereign will by treaties with others, and the limits of national sovereignty will always be changing with the needs of life and with the development of morals in international politics The only right thing to do will be to seek practical solutions of actual questions

Thus, I have no doubt that many of the walls now put up between the nations will have to be torn down, immediately or gradually All intercourse amongst them must be opened much more freely than has recently been allowed In particular the tariff walls must be lowered and, at least partially, broken In a way the war has done much of it already in reducing the financial importance of customs simply by stopping the imports to many countries, most specifically those occupied by the Germans All these countries, most of them small, will have to start anew their financial organization and will see their advantage in facilitating imports as much as possible A group of seven small nations, the so-called Oslo group, tried even before the war to create an area of non-increasing tariff duties I should not pretend that they succeeded in achieving something very considerable I rather think that the lines drawn up by Cordell Hull for mutual agreements on tariff cuts promise more for the future They may give a practical lead in the right direction

Further I presume that all nations must come to an agreement on certain civic rights that ought to be given to all citizens equally, in that way putting democracy on an international basis What I have in mind is a kind of international bill of rights, patterned to a certain extent on the American bill of rights of 1791 The principles that at that time, and by some later amendments to the Constitution, were imposed on all the states of this Union, might obtain universal force by an international treaty which, certainly, would mean a restriction of national sovereignty but, at the same time, would do nothing but confirm the ideas of all civilized nations. Of course, I should like to add to the civic rights proclaimed for this country the fundamental principle of democracy, government of the people by the people Incidentally, such an international agreement would serve to introduce and maintain freedom and democracy in Germany, thereby establishing a lasting protection for all nations whether large or small

As to decisions to be taken by the future international body, the idea of sovereignty should not be used to prevent vital measures from being adopted by the majority of the members Few people will deny that one of the chief defects of the League of Nations, as established in 1919, was the absolute demand, in the name of national sovereignty, of unanimity in all matters, however important Ever more it appeared contrary to all sensible conduct of international politics that a minority, however small, should be allowed to enforce its will upon the whole body, and efforts to loosen this strict rule were already active To maintain it in the future would mean the undermining of the very structure that should be erected. In the United States of America, for the body in which all the states are equally represented, the rule of a majority of two-thirds is established as to adoption of treaties. But even such a limited restriction of the unanimity rule seems insufficient and dangerous It is in vivid memory that only a minority of the Senate prevented the United States from entering the League of Nations, thereby deciding a highly important measure against the will of the majority of the representatives of the nation It would seem intolerable that such should continue to be the case in the decisions of international bodies

It will be objected that the Great Powers could not agree to submit to decisions taken by a majority constituted by small nations In the first instance, however, it is to be observed that opinions or desires asserted by Great Powers naturally will have a strong moral weight in the considerations of an international body—much more so if they should happen to be maintained by all of them And then, quite generally it must be presupposed that, in a future league of nations, questions should not be considered in the terms of power politics That was the fundamental disease of the late League of Nations—that the Great Powers within it always were engaged in thinking of what they might gain or lose for their position in the balance of power in the world If they continue living in the obsession of this idea, there will be very little hope for the solidity of a new league Unfortunately, we may still hear many people, even in this country, discuss the future from the point of view of balance of power, measuring the strength and the possible influence of the great powers against one another And obviously such ideas will continue to dominate if no change is perfected in the very mentality of the great nations

It seems not irrational to expect such a change. The United States of America presents, on the whole, the type of a great power that has no predominant aspirations to play a part in the rivalries of power The reasons for this attitude on the part of America may be manifold, both historical and geographical, but the chief reason, I think, is that this country is a democracy of long standing, having grown a great power only a long time after being firmly established as a democracy Undeniably it has had some brief attacks of imperialistic fever, and sometimes one will meet here expressions of a paternalism apt to estrange those who feel able to take care of themselves The idea of democracy, however, will at length be strong enough to stop all tendencies of domination, and that will be the case even with the other great powers among the United Nations The powers on the opposite side will need a long education before they can be relied upon in this regard; until that time they must be kept powerless to make any serious disturbances

It is necessary to stress that democracy is not merely a form of political government It is still more a mentality, and it is bound up with many social and economic conditions Imperialism cannot be definitely exterminated before society has been organized on such a basis that all temptations to conquest or exploitation of foreign nations are eliminated But the establishment of frank international co-operation as between equal partners may very well help keep back such temptations and finally conquer them completely Democracy will be one of the great forces acting for that aim

Just as, within the individual nation, unity and co-operation are immensely facilitated if the people it holds together speak the same language, so it will be within the society of nations as well. When I say "people who speak the same language," I do not think exclusively of language in the philological sense Still more I think of that community of ideas that offers a common ground of exchange of opinions and aspirations between people, whether they speak English or another tongue Fortunately, in this respect, the evolution of humanity has worked for integration as well as for differentiation The modern nations have acquired a vast treasure of common ideas, and the idea of democracy is one of the most important of them It is fundamental to the functioning of a league of nations

As early as a hundred and forty years ago, the man who first clearly distinguished the conditions of lasting peace, the great German philosopher Kant, concluded with the program of a universal union of republics—which was another way of saying democracies Almost instinctively people now speak of the United Nations as fighting the war of the democracies, although everybody knows that not all the nations united on this side are constituted on a democratic basis Nevertheless, they feel that the aim of this war must be the victory of democracy

Democracy, however, means nothing if it does not include the respect and maintenance of the free will of all peoples of the world, therefore also their will to organize themselves as free and separate states on the foundation of their existence as nations That implies plainly the independence of all the small nations in so far as they themselves wish to uphold it As a matter of fact, this principle is acknowledged as ruling the policies of all the United Nations by the so-called Atlantic Charter which, on January 1, 1942, all of them pledged themselves to defend and carry to victory By that charter they have unanimously declared that none of them desire to see achieved any territorial changes that do not accord with the freely expressed wishes of the peoples concerned, and that they want to see sovereign rights and self-government restored to those who have been forcibly deprived of them. According to this joint declaration no small nation ought to fear that she might lose her freedom

Somebody might suggest that those small nations which have betrayed their own cause by siding with the aggressor powers have put their own freedom at stake and may risk losing it Of course, they well deserve to be punished for their crime against their sister nations, and their wilful leaders certainly will be The nations themselves, however, will chiefly have to suffer the frustration of their hopes of illegitimate gains at the expense of others, and they cannot expect to obtain the same assistance from abroad to repair the damages inflicted on them by the war as can the invaded nations But the benefit of national freedom within the legitimate boundaries of their countries will not be denied to them, and, indeed, they may attain a higher freedom than they formerly enjoyed, in so far as they may see their dictatorial governments replaced by democracy

On the whole I believe that the victory of the United Nations will result in the strengthening of democracy everywhere It is a well-known fact that democracy was nowhere more firmly established, as well in the minds of the people as in their institutions, than it was in the small nations of Europe, most of which now are occupied by the Nazi aggressors The spirit of freedom living in these nations has been the vital element in their fight against Nazism It has fortified the hope and even the certainty of victory throughout all the fighting nations, and when, after the war, a universal society of nations will be busy rebuilding itself, their example will act like an enlivening force for freedom and democracy in all countries joining the new league of international justice We may even at the present moment observe movements of this character rising in such Latin American nations where, until now, the lower classes have been kept down in economic bondage and political pupilage And I recall my suggestion that certain democratic rights might be confirmed by international agreement for all countries

As I said above, no nations will be more eager to enter a universal league than the small nations who have suffered so cruelly from this war They certainly will be glad to leave to common agreement or to decision by law and justice all questions that might involve the maintenance of international peace or the friendly co-operation of the nations It is their highest interest to do so

It is, however, necessary to stress that the organization of nations for international peace and justice must be a universal one Only within the frame of such world-wide co-operation can the small nations feel safe and willing to abandon some of their sovereign rights By hard experience the world has learned that peace is a question that cannot be permanently solved for some few nations. It demands the united efforts of all of them It must, therefore, be warned against all ideas of leaving the defense of peace to more limited federations or regional alliances It was from the start an inherent and most essential defect of the League of Nations that it comprised only a part of the world, even three of the seven so-called Great Powers standing out of it, at last only two remaining. A new League on a similar foundation, even when comprising all the victorious powers, might appear strong in the beginning, but would inevitably grow weaker and weaker. So would be the case of a league of all present democratic nations as well. The reason is clear: every such partial grouping could not but provoke suspicions, fears, and counter-alliances, thus leading up to the same situation that was at the bottom of almost all modern European or world wars.

The argument by which regional federations often are urged in particular upon the small nations is, of course, their military weakness when standing isolated. Now it is not unfailingly sure that they always would be so much stronger, even from the purely military point of view, if they allied themselves for purposes of defense. It seems, for instance, highly problematic whether Holland and Belgium might have been better able to resist the German invasion in 1940 if they in advance had concluded a formal alliance; as a matter of fact, they fought shoulder to shoulder with all their forces but were crushed in the course of a few days. When considering the military problem of the Scandinavian countries, a study of their strategic position seems to make it clear that they could not offer each other really valuable assistance by military means; their fighting fronts would be so widely separated as to compel each of them to put all its forces into the defense of its own lines, and their most efficient mutual help would be, when one of them was attacked, to maintain a benevolent neutrality that could prevent the enemy from opening a new front.

Waiving, however, such military considerations which cannot lead further than demonstrating the probable uselessness of alliances of neighboring small nations, you easily will discover cogent political reasons, strongly warning against enterprises of that order. It is a fundamental question of our whole future whether we shall start again building up groups of nations arming for defense against each other and thus preparing for new conflicts. The Committee on Foreign Affairs of the American House of Representatives quite recently spoke of "the period of great international rivalry which unquestionably would follow the present war." Such a prediction grows out of a mentality extremely dangerous to the ideas of international co-operation which ought to unite all human efforts at the close of the war. By all means we must try to avoid creating or maintaining old hostilities and the division of the world into rival groups. Military alliances, rearming for war, even though solely for defense, cannot but result in rearming of other groups. Mutual fear may step by step lead to new wars.

Some of the small nations that were overrun by the German war machine may think that they should have to be better prepared for the next attack. They may feel that their military weakness was a reason for the invasion as well as for their defeat. As a matter of fact, they never will be able to measure up to great powers in military strength. And, still more important, they will counteract their own ideals and interests if they enter onto the way of rearmament. The Atlantic Charter, signed by all of them, has pledged the disarmament of the aggressor powers, and, of course, it must be an indispensable condition that this pledge will be severely enforced. But then, as a natural consequence, the charter promises to all the peace-loving nations a lightening, not an increase, of the burden of armament that hitherto was placed on their shoulders. The protection of the small nations shall not be their arms but the disarming of the aggressors and the establishment of a universal system of justice and law.

Perhaps it might appear practical, and therefore possible, to institute a kind of mandatory system by which the future league, in special cases, will decide to delegate its authority to maintain or restore peace in a certain area to some individual nations on behalf of the universal organization. But even such a procedure must be used only very prudently and not become the rule.

However, after having pointed out the dangers of leaving the defense of peace to more or less limited regional federations, I think it right to state that for many other purposes regional organizations within the universal framework may prove very useful and even be necessary. In fact, a long time before this war, much international co-operation of a geographically limited scope was already actively functioning without assuming any character of political alliance or essential curtailing of national freedom.

As a practical instance I may point to the Scandinavian kingdoms. The people living there are in possession of that unusual advantage of being able to understand the languages of each other without the need of translation, and thus there were great opportunities of intellectual co-operation In consequence, Scandinavian congresses of all kinds of experts in sciences and studies, in education and athletics, in technics and trade, have a long history behind them, having produced common Scandinavian magazines and Scandinavian associations in many fields Such steady exchange of ideas and the similarity of social and political development have brought along even co-operation for economic and political purposes, congresses for common ideas such as peace and labor politics, agreements between employers and employees, shipowners, pulp and paper manufacturers, trade unions, etc On the top of all these private activities has come the increasing co-operation of public authorities And it is a highly remarkable fact that this aspect of what may be called official Scandinavianism has assumed increasing importance after the dissolution of the political union between Norway and Sweden in 1905 Only since that time have the regular meetings of deputies of all the Scandinavian parliaments taken place, and so is the case as well of the steadily more frequent meetings of the foreign ministers of all the countries The most significant 'result of Scandinavian co-operation, the adoption of important uniform laws in several matters, had come into appearance at an earlier date but attained its most considerable extension only after 1905 In the 1870's the three Scandinavian kingdoms agreed upon uniformity of currency, unfortunately different from all other European currency The effect of this act was destroyed by the economic disturbances in the wake of the first World War, and now the only hope would be a general stabilization of currencies The uniform laws enacted are, however, still standing There are the bills of exchange acts of 1880, the navigation acts of 1892, and then after 1905 a whole series of acts regarding purchase and sale, contracts, checks, merchandise marks, commercial registry, and also the rules of matrimony and the position of married women An effective system of co-ordination has been worked out and has been functioning as to mutual assistance to the poor and as to disabilities insurance

I note and repeat that all this co-operation, uniting the Scandinavian nations in many practical regards, has been achieved without any kind of political union or compulsion, solely by voluntary acts founded upon common interest and friendship, as a natural fruit of good neighborliness And this Scandinavian attainment, although farther developed than anywhere else in the world, is not unique in the very essence of its character In fact, it is typical in its fundamental tendencies I remind you of the increasing development of voluntary co-operation between the members of the British Commonwealth, coming along parallel with the growth of political independence Further I may call to memory the co-operation of good neighborliness embracing the whole American hemisphere For several practical matters a Pan-European co-operation will serve useful purposes and even lead on to wider organization Perhaps after this war we may hope that Russia will adopt the gauge of railroad tracks common in Western Europe, and that all European countries will agree on right driving on their highroads In all fields of intercourse by land, sea, and air the unity of Europe is a practical need, and this situation might be of consequence even to tariff policies Continental Europe has accepted in common the decimal system for weights and measures, in fact, only the Anglo-Saxon world is still holding out against this rational reform The Postal Union as well as the intercourse by wire and wireless embrace the whole world The International Labor Office attempts to establish uniform rules in a field that sensibly affects the economic competition of the nations

On the whole, we see before us wide potentialities of voluntary co-operation of the nations outside the political organization for universal peace, and the extent of such co-operation in each particular case will have to be determined by practical considerations of geographical or constitutional order Compulsory uniformity would be of little avail or even mischievous The sentiment of freedom is just as dear and honorable to nations as to individuals, and still more for the small nations than for the great powers the feeling of living in safe liberty will strengthen their wish and will to line up with the rest of the world for furthering universal justice and peace

Big nations will always be inclined to overlook the small ones The great men and the great achievements of small nations will often remain completely unknown to others Nobody, however, who earnestly will study and understand human progress can omit to see and appreciate what the small nations have given to the world You may discern the strong impact of their activities in literature, music, arts, sciences, technical inventions, in social and political development, though always less fruitful for humanity than they had deserved or had been desired Often you may think that the small nations themselves are too modest and really mistaken in hiding away their great gains and works in languages that can be understood by only a few people outside their own frontiers, it should be their duty to speak to the world more than they have hitherto done in some more widely known language

Just now it ought to be highly *important* to the whole world to know to what a remarkable degree and strength democracy and social responsibility have been developed in many small nations Sometimes you might think that just because they are small they have been able to permeate the whole society with such a spirit of allegiance to law and will of co-operation as we may witness in them. You may recall what Rousseau taught about democracy--that it could exist in perfect action only in small nations, and if it should be achieved in a large nation, it would have to be on the condition of a federal constitution Perhaps that is the reason why in no big nation will you find democracy so firmly established and developed as in the United States Anyhow, the achievements and the aspirations of the small nations in this regard constitute one of the very foundations of the future society of law and peace that all good forces of our days are hoping and working for For that reason it would not only be ungrateful, it would be a most obnoxious error, to try to wipe out the small nations as individual units and free members of a world-wide association Hitler wants to do it No man who loves liberty should join him

INDIVIDUAL, FAMILY, POPULATION, AND RACE

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(Read November 21, 1942)

HOSTILITY between groups that form closed societies is a very ancient phenomenon, not confined to man, but also present in the animal world. It is not by any means necessarily connected with differences in bodily form but may be based on a great variety of traits of behavior. Among many primitive people the only individuals dignified by the term human beings are the members of the tribe. It even happens in some cases that the language will designate only tribal members as "he" or "she," while all foreigners are "it," like animals. When a conquering tribe overpowers another tribe of distinct bodily build, the hostility of the two groups will take the form of race antagonism. In other cases the groups may have been the same in bodily appearance and still the same contempt of the socially inferior group developed. Such was the case in the conflict between Patrician and Plebeian in Rome, between Mohammedan and Infidel, between Catholic and Protestant. As a protection of the purity of the group a tendency develops everywhere to hinder intermarriage between such groups.

During the last century there has been a decided tendency to ascribe such social antagonisms to biological causes. It is assumed that the antagonisms are founded on genetically determined characteristics of the members of the whole group. The racial discriminations of our times and the claims to racial superiority demonstrate the dangers involved in the uncritical failure to differentiate between social and genetic forces, in the lack of understanding of the relations between the individual and the group to which he belongs, and in the vagueness of the concept "race."

Early zoölogists described human "races" according to striking features of bodily form, like Europeans, Negroes, Mongols, Australians, without stressing individual variations in each group. They also did not hesitate to ascribe to each race mental characteristics which were based on their present real or supposed cultural characteristics.

A more precise definition of race was obtained from the study of domesticated animals. In these a race is defined as a series of pure breeds in which each generation repeats the characteristics of the preceding generation in accordance with certain selected stable characteristics which show only slight individual differences. Such characteristics may be expressed in bodily form and also in physiological and mental behavior.

The modern theory of racism claims that the characteristics of every individual are determined by his position as a member of a race. To prove this it would be necessary to show that groups of men exist in which each individual conforms to a certain type, so that he may be an adequate representative of all the members of the group.

A scientific answer to the problem demands, therefore, an investigation of the question of the occurrence of individual differences in purebred groups of man.

If it were possible to find such a population, the problem would simply be to determine the extent of individual variation in such a group. If such variations did not exceed narrow limits, we would have to conclude that the characteristics found within these limits are racial characteristics of the group in question.

As a matter of fact we have no such purebred groups. All we can observe are individuals and populations. Populations may be groups of blood relatives, local or social groups.

The individual may be described accurately without reference to the group to which it is to be assigned, either as a form as it appears at a given moment or as it develops and decays, from conception to death.

Difficulties arise when the individual is conceived as representative of a group, as representative of what we call "a type." It should be clearly understood that the concept "type" contains unavoidably a strong subjective element. We form it by concentrating in a single individual the most frequent forms that we observe in a mass of individuals. When in a

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* Deceased December 21, 1942.

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population many individuals are tall, blonde, with short noses, small ears and so on, we construct the typical individual as one that has all these characteristics, without considering that actually a single individual that combines all these characteristics is exceedingly rare, the more so, the more independent traits are included in the characterization Still more dangerous is the transfer of the impression of the existence of a type abstracted from the observations made in one population to that of another one of somewhat different composition Under such conditions even experienced anthropologists have been induced to recognize the "type" with which they were familiar as a constituent, separate element of the new population they were investigating

Still another danger is involved in concentrating our attention on extreme forms, a tendency particularly noticeable in the studies of constitution It is true that by the study of extreme forms, as for instance the tall, slim types and short, stocky types, certain interrelations between forms or between form and function may be discovered that are obscured in the whole mass of individuals, but this does not mean, as is all too often assumed, that the whole mass consists of a mixture of these types, because each "type" is merely an artificial selection from a large group Such a selection from a population of those individuals who agree within narrow limits in regard to a number of traits that are morphologically important, and segregation of these as a racial unit are not justifiable because it can be shown that such groups, when selected from different populations, are genetically distinct. If, for instance, we should select in this manner a group of Bohemians and Sicilians who are identical in regard to certain bodily features, and these can be found notwithstanding the great differences in the frequencies of distinctive bodily forms in these two groups—we should find that the children of these Bohemian parents tend to resemble the general trend of Bohemians, those of the Sicilians the general trend of Sicilians.

Summarizing these considerations we may say that the attempt to find any group of man who might be called "a race" in any well-defined meaning cannot be successful as long as it is based on the essentially psychologically determined concept of type

To answer the question whether or in how far the bodily characteristics of an individual are determined by his descent we must apply the rigid definition of what constitutes a race. The individual is first of all a member of a family and we ought to determine in how far members of a family are alike or differ among themselves. The next question should be, in how far do families differ in their characteristics among themselves or in how far are they alike Finally we should have to investigate in how far the hereditary characteristics of individuals and families are stable or subject to change under varying conditions of life

In experimental studies of animals or plants all these conditions can be controlled Certain bodily, physiological, and mental characteristics that are controlled by simple laws of heredity can be selected and by continued inbreeding of selected forms can be stabilized, so that in controlled breeds the selected features appear regularly in all individuals, in generation after generation

In man such controlled inbreeding is impossible We cannot raise generations according to selected traits We know only populations that differ in regard to various traits If it were possible to find a thoroughly inbred group of man in which all family lines, without exception, are identical, we might say that we have found a race, not in the sense that all individuals are alike, but that any one family line would be an exact representative of the whole population In such a population the small ancestral group might have been of quite diverse origin which would be expressed in considerable variability of the children of each family Only if the ancestral group was of homogeneous descent could we expect that not only each family but also each individual would be a representative of the whole population, and we could claim that this population would be a racial unit

From this point of view we can try to solve the question of racial purity and prove or disprove the claim that the individual must share in all the characteristics of the group to which he belongs It is, therefore, important to search for the most highly inbred populations and to determine in how far in such populations individuals constituting a fraternity may differ among themselves, and in how far family lines may differ among themselves. Equally important is a study of the relation between the variability of family lines and of fraternities, because the former depend upon the amount of inbreeding, the latter on the diversity of hereditary lines present in the ancestral population

I have been enabled to carry through part of such an investigation with the help of a grant from the American Philosophical Society and of the Council for Research in Social Sciences of Columbia University I selected a number of highly mixed populations, like those of our eastern large cities, other groups more uniform because members of a well-defined national group, and by contrast isolated groups that had for a long time intermarried among themselves Areas from which such observations are available are not numerous The best series are the Scandinavians of the Faroe Islands, the group of islands located between Scotland and Iceland Besides these I had the East Siberian tribes of the Chukchee Peninsula, Chippeway Indians of a few communities that have for a long time intermarried among themselves, the so-called Bastaards of South Africa, a mixture of Hottentots and Dutch who also have formed for a long time a socially isolated community, the Pitcairn Islanders, descendants of mutineers of an English vessel and Polynesian women; and a mixed Malay-Dutch population from Kissar. It will be noticed that among these only the Faroe Islanders and the East Siberians are of fairly uniform origin, while the ancestry of all the others includes divergent human types Dutch and Hottentot, English and Polynesian, European and American Indian, and Malay and Dutch The results of the study demonstrate a sharp cleavage between these isolated groups and the two other groups, the one composed of city dwellers of mixed origin, the other of widely spread national units, like Italians, Bohemians, and East European Jews

In the former group we find a much higher degree of similarity of family lines as compared to fraternal similarity than in the latter No matter whether the ancestry is uniform or mixed, the family lines are somewhat alike, while the brothers and sisters in each family are unlike. We may express the degree of similarity of the family lines by the ratio between the variability of siblings and that of family lines In isolated, inbred communities the siblings are 1.5 to 2 5 times as variable as the family lines. In the highly mixed population of Boston they are less than .8 times as variable as the family lines. In national groups the ratio is a little more than one. In a study of this kind we must be sure that the family groups consist of real brothers and sisters This can be ascertained from a study of the similarity of fathers and mothers and their alleged children. Only when fathers and mothers show the same degree of similarity can we conclude that the alleged fraternities are true fraternities

While it would be highly desirable to have studies of many more inbred societies, we may infer from the data here gathered that there is no human group in existence which is so uniform either in fraternal groups or in family lines that any one individual can be considered as a representative of the group In other words, there are no characteristics known to us that would allow us to claim that individual characteristics are determined by traits common to the whole group However we select groups of man, we do not find pure races such as we raise in domestication of animals and cultivation of plants or in experimental series

A strict interpretation of what we mean by "race" also implies that under equal conditions the series of generations would retain their character, if not for indefinite periods, at least for a reasonable number of generations, and that all changes that occur must be accounted for by changes of environment Excepted would be purely statistical changes due to differential birthrate and deathrate or to selective migration In a completely homogeneous race, these would have no influence anyway

Evidence of a certain degree of instability of bodily form has been accumulating in recent years. Since 1909, when I showed that the children of American immigrants differ in bodily form from their own foreign-born parents, additional proof has been forthcoming I mention particularly Dr Shapiro's observations on Japanese immigrants in Hawaii It is most interesting that only last year a study of East European Jews appeared in Germany which corroborates the instability of bodily type that we observed here It is hard to see how the results of this study can be harmonized with Nazi racial theory, and we wonder that it was ever allowed to see the light of day

All these considerations are not in conflict with the obvious fact, that varieties of man, like Europeans, Negroes, Asutralians, can be clearly and definitely differentiated They show that in none of these varieties purebred groups are found It must also be emphasized that, while in some bodily traits the varieties of man are clearly distinct, in others they show only minute differences or no differences whatever.

While the anatomical changes due to environmental causes are probably always slight, physiological, psychological, and social changes are fundamental and of the same character in all the varieties of man The physiological behavior of the body is adjustable to a great variety of external conditions, to climate, altitude, food, type of occupation Under the same environmental stress individuals of varying anatomical form will react in the same way, while the reactions of the same individual in varying environment will not be the same What is true of physiological function is even more true of mental and social behavior As an example of mixed physiological and social behavior we may point to language. Within a wide range of forms of the articulating organs the pronunciation of an individual does not depend upon the form of the mouth but on the articulation of the group in which he is growing up. The fixed character of an individual's speech is determined by what he learns in childhood, not by the form of his pharynx, nose, tongue, palate, and lips. Observations of this type are valid regardless of the variety of mankind to which the individual belongs.

On account of the dependence of physiological and psychological characteristics upon natural and social environment, it is exceedingly difficult to ascertain any genetically determined characteristics of this kind among the clearly distinctive anatomical varieties of man. While we cannot claim that identity of all varieties of man in regard to these traits has been established, the available evidence proves that particularly for the complex functions which depend upon culture, no genetic difference of any significance has ever been proven

Here also the adaptability of successive generations gives the crucial answer Are forms of use of the body, mental processes, and social habits determined by heredity, and therefore constant for successive generations, or are they determined by social environment?

We have made an experimental investigation of this problem by studying the gestures of various national immigrant groups who live here in America in separate districts and by comparing them with the habits of their Americanized descendants This study was carried out by Dr David Efrón, who was able to show that uniformity of style of gesture develops in a stable social environment, but that it is broken when the social environment changes He has proved this both by historical analysis and by individual observation Italian gesture habits are very old and may be recognized in ancient paintings They were imposed upon France when the court came under the strong influence of Italy Early English motor habits used to be lively and contrast strongly with Victorian restraint Here in America national gestural habits of immigrants are first markedly weakened, finally lost under the influence of American descriptive, emphatic, and didactic gestural habits In short, there is no proof that such habits are founded in any way on racial descent. On the contrary, all the evidence we have shows that they are socially determined

These considerations show conclusively that we do not know of any group of men in which the individual can be considered a representative of the whole group, because the component individuals of any group vary markedly among themselves In other words, "race" does not determine human behavior. I wish to be clearly understood I do not claim that it has been proved that biologically or, better, genetically determined characteristics are exactly the same in all populations. I do maintain that every known population, no matter on what principles it is selected, shows a wide degree of variation of forms; that no pure human race exists, and that behavior is much more rigidly controlled by natural and social environment than by descent.

SOME IMPLICATIONS OF POPULATION CHANGE FOR POST-WAR EUROPE

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(*Read February 19, 1943*)

CHANGES in the number and distribution of people so sweeping as to alter the world's balance of power are now clearly visible It is the curious fact that these changes are receiving less attention in current discussions of post-war problems than the details of social, economic, and political arrangements It is curious because the future size and distribution of population can be discussed with considerable reality, even in an uncertain world It will become tragic if post-war arrangements prove ill-adapted to emerging population changes. From the beginning they would contain the seeds of their own destruction

Today, I propose to illustrate the bearing of demographic trends on future policy by discussing some of the work on Europe which my colleagues and I, at Princeton's Office of Population Research, have undertaken in co-operation with the Economics Department of the League of Nations. First, I shall discuss some of the fundamentals of population change, and describe briefly the interwar position. Then I shall consider the prospects for future change in the major demographic regions, and some of the implications of those changes for each region Finally, I want to discuss what seems to me to be the broader meaning of trends now visible for international policy.

FUNDAMENTALS OF POPULATION CHANGE

First of all, it is important to realize that we have been living in a unique period of the world's demographic history—a period of unparalleled population growth. Since 1800 the number of people of European culture has increased perhaps threefold. For Western Europe, this period is drawing to a close and will not return in a future that matters It developed because of changes in birth and death rates so sweeping as to amount to a vital revolution. Before this vital revolution, high death rates nearly cancelled high birth rates to yield little natural increase. In the modern industrial West, where the revolution has most nearly run its course, both death and birth rates are now low, yielding again small increase. The rapid growth occurred during the period of transition from high to low vital rates because mortality led fertility in the downward trend This entire pattern of lagging transition in vital rates, and the resulting wave of growth, did not begin simultaneously all over Europe Instead, it spread slowly from West to East with the technical and industrial revolution The result is that the various regions of Europe are in widely different phases of the wave of growth The Soviet Union and Eastern and Southern Europe are in different stages of the growth phase, while in Northwestern and Central Europe the transition is most nearly complete, and the prospects for future growth are small

Lest the assertion that the prospects for future growth in Western Europe are small seems to be mere crystal gazing, it will be well to consider the interwar position If fertility and mortality remained at the levels of 1933 and there were no migration, the population would ultimately decline by more than 25 percent per generation of about 30 years in Austria, Germany, and England and Wales The vital rates of the early thirties would ultimately yield declines of from 15 to 24 percent per generation in Estonia, Sweden, Norway, Belgium, and Switzerland, declines of from 5 to 14 percent in France, Latvia, Scotland, Denmark, and Czechoslovakia, and of less than 5 percent in Finland and Hungary Ireland and the Netherlands were the only Western nations above the permanent replacement level. The remaining European countries had schedules of mortality and fertility which, if maintained, would yield population increases ranging from 10 percent to more than 50 percent per generation in the case of the U. S. S R Summarizing the position at the end of the interwar period, we may say that the eastward wave of population growth probably was near the crest in the U. S. S R, high but receding in Eastern and Southern Europe, and at a developing trough in Northwestern and Central Europe. The war will modify these trends in a direction which is all too clear

PROSPECTS FOR FUTURE POPULATION CHANGE

For the time being it will assist the analysis to leave the effects of the war out of account, and centering our attention on underlying trends, to consider the broad prospects for future change. Western Europe would face declining numbers if it retained the age-schedules of vital rates which characterized the thirties. Of course, these schedules will not be retained. A long period of political chaos might drive mortality higher after the war. If it does, the discussion of population trends per se would serve no useful purpose. If, as seems more probable, there are some decades of settled peace, mortality probably will continue its long downward trend. Where health conditions are bad, the improvement should be quite rapid, where they are normally good, progress can be expected to be less rapid. Any decline in mortality will, of course, stimulate growth, or check decline. However, in many countries an improvement in mortality will not prevent population decline. In several areas the fertility of the early thirties was already so low that it would not permanently maintain a stationary population even if there were no deaths from birth to the end of the childbearing period. This situation obtained in Austria, Germany, England, Estonia, Sweden, Norway, Belgium, and Switzerland. In such areas a population decline can be forestalled only by immigration or a rise in fertility.

Fertility might rise after the war. It has already done so in Nazi Germany. There the vital schedules of 1933 would have yielded an ultimate decline of 30 percent per generation, but those of 1940 were about sufficient to maintain a permanently stationary population. However, it is doubtful that, even without the war, the 1940 schedule of fertility could have been maintained. The increase came in considerable part from a flood of postponed marriages and children elicited by the reemployment program, state subsidies for marriage, and a general revival in popular confidence in the future. This source, once drawn upon, is not available again.[1] Moreover, there are powerful forces in Western life tending toward a further decline in fertility. In our individualistic society many of the satisfactions of parenthood are as well obtained from two children as from more. On the other hand, the penalties of parenthood, in terms of physical discomfort, domestic routine, and mounting costs, increase rapidly as the family grows. The strength of the pressures toward small families is reflected in the fact that there probably is no substantial population group having its fertility under effective control which is reproducing at more than three-quarters of the replacement level, and in these low fertility groups there is no evidence of a real upward trend. Even in countries where fertility on the average is low, there are substantial sections of the population in which it is high but falling rapidly. There is every indication that the small family pattern is spreading to these still divergent groups. In the absence of drastic social-economic change, it is reasonable to expect the general trend of fertility to be downward for some years to come.

If the future yields an orderly development of the vital trends of the interwar period, we should expect that both mortality and fertility would tend to be most rapid where the rates are highest, and least rapid where they are lowest, and that the rates of decline would become progressively smaller as time went on. These general principles can be applied in close conformity with past experience to yield age schedules of fertility and mortality for the future which are reasonable in the light of the assumptions. These predicted vital rates permit us to formalize our general predictions in a series of population projections. All that is required is to add projected births to the census populations appropriately aged and subtract projected deaths from them.

My colleagues and I have constructed a series of such projections for the years 1940 to 1970 for the U.S.S.R. and each European nation as of the 1937 boundaries.[2] The underlying as-

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[1] Kirk, Dudley. The relation of employment levels to births in Germany. *Milbank Memorial Fund Quart.* 20 (2). 1–13, 1942.

[2] The development of these projections is primarily the work of Ensign Ansley J. Coale, formerly a member of the technical staff of the Office of Population Research. The whole process is a somewhat intricate one, only the outlines of which can be suggested here.

In the case of mortality, life-table death rates for each age were obtained for all the available European experience back to 1870. This experience was aggregated to give the general course through which mortality has moved in Europe from high to low. The curves representing this average course were extended with decreasing rates of decline to permit their use for the countries with the most favorable experience. The last observed rates for each country were located on the curves, and values read forward at successive five-year intervals to 1970. In other words, we have assumed for the future the same type of improvement in mortality that has actually gone on in the past. The method proved highly accurate in projecting the exsumptions must be kept in mind They are (1) that the future course of mortality and fertility will represent an orderly development of the trends of the interwar period, (2) that there will be no international migration, and (3) that there is no war The first assumption is reasonable only in the event of a United Nations' victory, and in the absence of strong pro-natalist policies or other sweeping social-economic changes The assumption of no migration is false but has the virtue of permitting us to examine the internal potentialities for growth It is too early to give any numerical expression to the effects of the war I shall discuss the matter qualitatively later on The population projections must be thought of as showing the results to be expected from undisturbed, underlying demographic trends In this sense we believe them broadly predictive However, closely examined, they are only working models useful for analysis Actual experience certainly will not follow them in detail Economic fluctuations, political disorders, indeed changes in the weather, will introduce at least minor year to year fluctuations

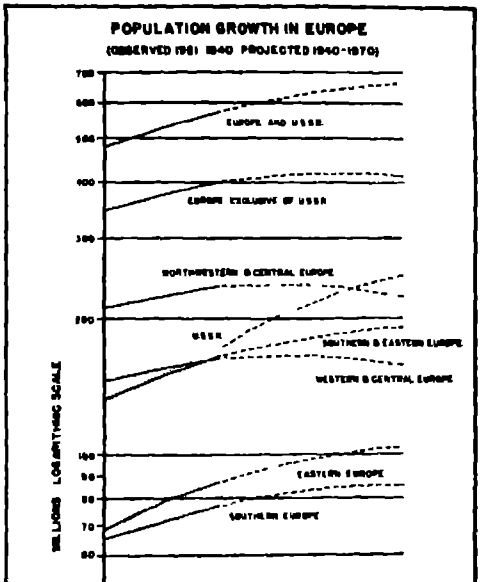

FIG 1

Figure 1 summarizes the results, as far as total numbers are concerned, for the U S S R and the regions of Europe[3] The solid lines show the

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pectation of life at birth in 1930 from the mortality experience of 1900 1910

We assume in the case of fertility that the general trend of all rates will be downward This assumption is made in the face of the fact that there was a tendency for the rates to rise for the period of economic revival, 1935–1939 This rise is viewed as a temporary rebound from the depression low To get at the underlying trend in fertility, freed from temporary disturbances the experience of the early twenties and that in the late twenties were averaged to stand for 1925, and the experiences of the early thirties and the late thirties were averaged to stand for 1935 The difference in the rates centered on 1925 and 1935 is taken as the measure of slope Rates centered on 1925 and 1935 were averaged to give the height as of 1930 The height-slope relation for all European countries having adequate data was then plotted; it showed clearly that the downward slope was most rapid where the rates were highest and least rapid where they were lowest This height-slope relation for Europe was then used to establish the initial slope from the last observed height of rate in each country A smooth curve (rectangular hyperbola) having the appropriate initial height and slope was then applied The curve is asymptotic to zero, hence gives a decreasing rate of decline as time goes on Any number of other curves would have served as well The family of curves used maintained substantially the same order of rates by country in 1970 as was observed initially and had the advantage of simplicity Other functions meeting these requirements would not have given widely different results

Since, in the case both of mortality and of fertility, the method utilized averages European experience for the projections of each country, only an adequate census and recent age-specific fertility and mortality rates were required to obtain projections In some countries, particularly the U S. S. R and those of Eastern Europe, even these data were often either inaccurate or lacking In such cases it has been necessary to make as careful estimates as possible on the basis of such information as does exist The results in these cases are naturally less reliable than those for countries with more adequate statistical records. The projections have been made for the U S S. R and for each country of Interwar Europe

[3] In this paper the following classification of countries into regions is used

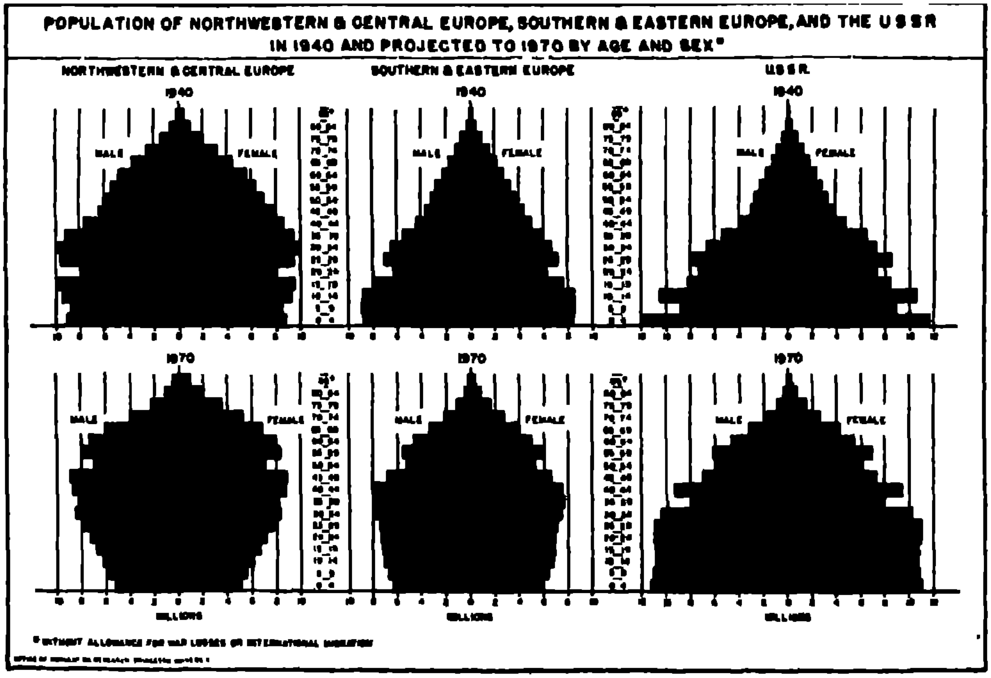

Fig 2

actual populations between 1921 and 1940, and the broken lines the projections The scale is semi-logarithmic, hence equal rises indicate equal percentage increases, not equal absolute increases On the assumptions of no war, no migration, and an orderly development of past trends, the U S S R would have the most rapid growth of the regions studied It would move from 174 millions in 1940 to 251 millions in 1970, from a population 44 percent as large as that of all non-Soviet Europe to one 60 percent as large Changes to be expected in non-Soviet Europe are relatively small, the increase from 1940 to 1970 being only 18 millions and the maximum population being reached by 1960 This relatively stationary population of non-Soviet Europe is the resultant of widely divergent trends as between regions. Without war, Eastern and Southern Europe would grow rapidly but Northwestern and Central Europe would reach a maximum of about 237 millions by 1950, and then decline to 225 millions by 1970.

More important than changes in total numbers, which occur only gradually, are those in the size of constituent age groups. How drastic such changes are is shown by figure 2, which permits comparison of the 1940 population with that projected for 1970 in Northwestern and Central Europe, Eastern and Southern Europe, and the U S. S. R. In these pyramids each bar represents a five-year age group with males to the left and females to the right. The group aged 0–4

Northern, Western, and Central Europe
- United Kingdom and Ireland
  - England and Wales
  - Ireland
  - Northern Ireland
  - Scotland
- Western and Central Europe
  - Austria
  - Belgium
  - Czechoslovakia
  - France
  - Germany
  - Hungary
  - Netherlands
  - Switzerland
- Northern Europe
  - Denmark
  - Estonia
  - Finland
  - Latvia
  - Norway
  - Sweden

Southern and Eastern Europe
- Southern Europe
  - Italy
  - Portugal
  - Spain
- Eastern Europe
  - Albania
  - Bulgaria
  - Greece
  - Lithuania
  - Poland
  - Roumania
  - Yugoslavia

U S. S. R.

is the bottom bar, that 5–9 the next one up, and so on The top bar stands for persons over 85 years of age, a group that death has almost extinguished Much of the history of past events may be read from the pyramids For example, in that for Northwestern and Central Europe in 1940 the persons who had survived to age 30–34 years in 1940 were more numerous than those under 5 years of age because the birth rate has been declining. The bar for persons 5–9 years of age is relatively short because of the depression dip in the birth rate The gash in the population 20–24 years of age is the result of the short crop of babies during the last war There are relatively few males 40–55 years of age in the 1940 pyramid because that group bore the brunt of the first war's casualties

In the pyramid of the population projected for 1970 in Northwestern and Central Europe the age groups are all advanced 30 years (6 bars), after appropriate reduction by mortality The result is a rapid increase in the size of the older age groups In this pyramid all age groups under 30 come, of course, from projected births. The narrowing of the base of the pyramid suggests that the projected birth rates were dropped very rapidly In fact, however, since birth rates in this region were already low, they were reduced much less rapidly than those either in Southern and Eastern Europe or in the U S. S R The heavy erosion of the base of the pyramid is due less to projected declines of fertility than to the fact that after 1940, large contingents move out of the childbearing period and are replaced by smaller ones. The narrowly based pyramid for 1970 is, therefore, not so much the result of what we assume will happen to fertility, as of what has already happened to the contingent of potential parents of that period

The pyramids for the U S S R stand at the other extreme, and those for Southern and Eastern Europe in the middle. The different stages of demographic development of the three regions may be seen by comparing the pyramids for 1970 with those for the region to the left in 1940. The population projected for 1970 in Eastern and Southern Europe lies a little ahead in demographic evolution of that for 1940 in Northwestern and Central Europe, while that for the U. S. S. R. in 1970 lies a little ahead of that for Southern and Eastern Europe in 1940. In other words, Southern and Eastern Europe is a little less than a generation behind Northwestern and Central Europe in demographic development and about as far ahead of the U S S R The pyramids for both Southern and Eastern Europe and the U S S R in 1940 show the characteristic narrow top and broad base of regions with high mortality and high fertility The pyramids for the 1970 population both show the rapid increase of persons of all adult ages resulting from the assumption that death rates will fall most rapidly where they are now worst Neither gives the immediate impression that sharp declines in fertility were projected between 1940 and 1970. In fact, however, projected schedules of fertility declined very substantially in Southern and Eastern Europe and most rapidly of all in the U S S R The pyramid for Southern and Eastern Europe is only slightly eroded and that for the U. S S R. is scarcely undercut at all because in both regions the number of potential parents increases rapidly between 1940 and 1970. This increase in potential parents offsets the assumed shrinkage in size of their families Because of this situation the U S S R can coast into a huge population, even if its fertility undergoes a spectacular decline

It is clear that, under the assumptions stated, the center of population growth will shift eastward, the U S S R will face very rapid growth, substantial growth will go on for a generation in Southern and Eastern Europe, and Northwestern and Central Europe faces an imminent cessation of growth with a rapid increase in the older age groups.

NORTHWESTERN AND CENTRAL EUROPE

With this broad characterization of the major demographic regions before us, we may turn to a more careful examination of the situation in each region. Under the assumption of no war, no migration, and an orderly development of interwar trends, the Northwestern and Central region would reach its maximum population by 1950 Maximum size for the period 1940-1970 would be attained or passed by 1945 in England and Wales, Sweden, Estonia, France, Belgium, and Switzerland By 1955 Scotland, Latvia, Finland, Norway, Germany, Austria, and Czechoslovakia would be added to the list The remaining countries of the region reach their peak populations by or before 1970.

Of course, the war will alter these results, which serve chiefly to illustrate the underlying situation. It is clear that the major belligerents of the West—Germany, France, and the United

Kingdom—already have passed their peak populations The same is probably true of some of the smaller belligerents and perhaps of some of the neutrals At this stage it is impossible to measure the effect of the war. However, we can illustrate the type of effect the war may have by assuming that the losses in the present conflict through deficit in births and excess civilian and military mortality are proportional in each age group to those of the last war My colleague, Mr Kirk, has constructed such an estimate for the German population in 1950 It is shown in figure 3 by the solid black area which has somewhat the appearance of a formalized Christmas tree Outside this solid black area lie heavily hatched blocks which represent the loss of two wars on the assumptions specified The losses in births as a result of mobilizations (*i e* at ages 30–34 from the first World War and at 5–9 from the present war) are clearly apparent War casualties are reflected in the larger hatched areas on the male side of the pyramid, civilian losses as a result of blockade, epidemic, and war strain in the lesser depletion of the female population The outer section of the pyramid shows the population that Germany would have had by 1950 if neither war had taken place and fertility and mortality had remained at the levels of 1910 Mr Kirk estimates that the German population of 1950 will be about 25 millions less because of the decline in fertility and perhaps 10 millions less because of the losses of two wars It was this situation which led German students of population to conclude before the present conflict that, with another war as costly in life as the last one, Germany could not again be a dominant world power France and the United Kingdom are in demographic situations that differ considerably in detail from the German one, but the fundamentals are the same Both have passed the peak of their demographic power, and neither is in a position to recuperate from heavy war losses

The meaning of prospective population changes may be examined with the assistance of figure 4 This chart shows the change between 1940 and

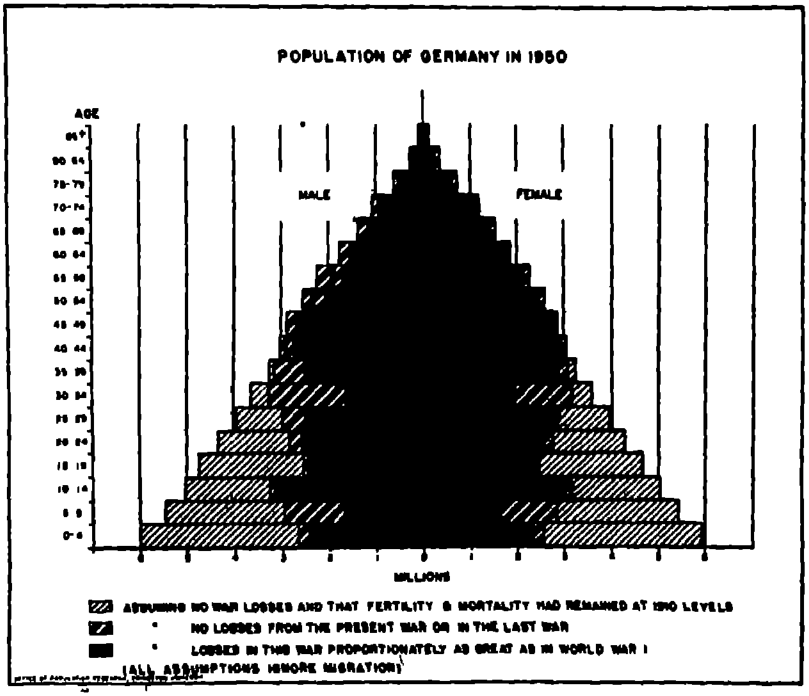

FIG. 3

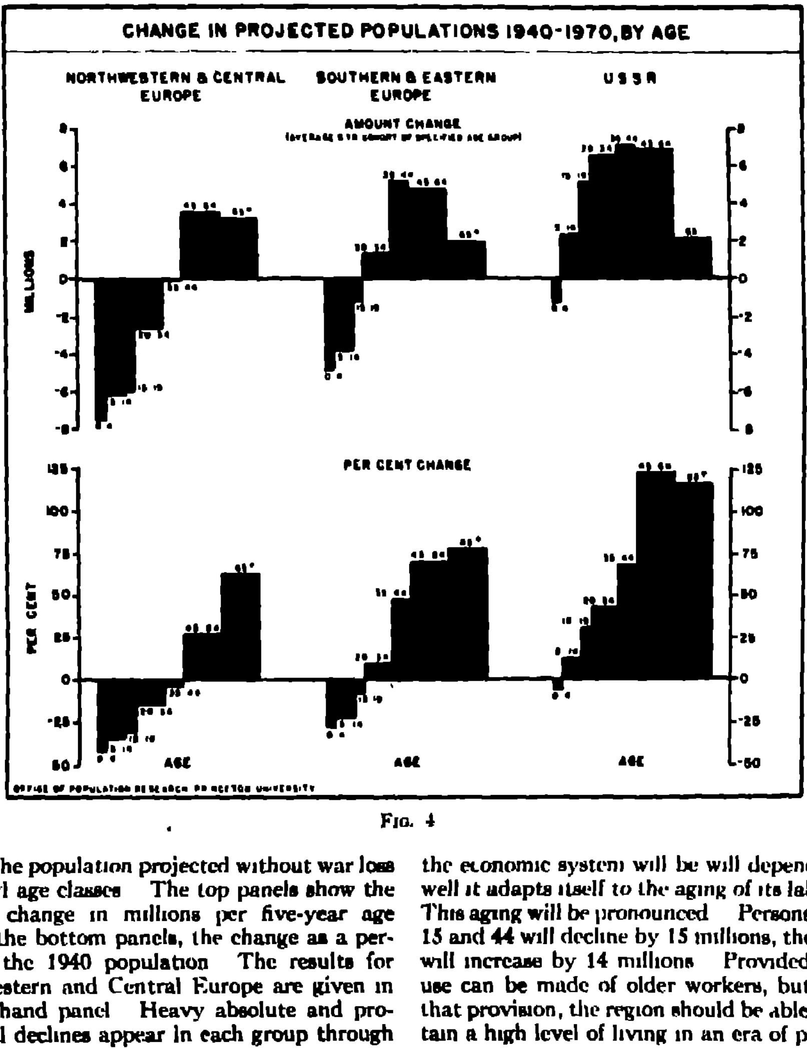

Fig. 4

1970 in the population projected without war loss for broad age classes The top panels show the average change in millions per five-year age cohort, the bottom panels, the change as a per cent of the 1940 population The results for Northwestern and Central Europe are given in the left-hand panel Heavy absolute and proportional declines appear in each group through age 35 There is a slight loss from 35–44 and then large gains for all ages over 45 If we take the ages under 15 and 65 and over as roughly those of economic dependency, then the region faces a net loss of dependents of about 7 millions, the gain in those over 65 being less than the projected reduction of children Meanwhile the productive ages lose only about one million persons. On the present assumptions, therefore, the region does not lose in its favorable ratio of producers to dependents. What the influence on the economic system will be will depend on how well it adapts itself to the aging of its labor force. This aging will be pronounced Persons between 15 and 44 will decline by 15 millions, those 45–64 will increase by 14 millions Provided efficient use can be made of older workers, but only on that provision, the region should be able to maintain a high level of living in an era of peace It is much more doubtful that it will be able to maintain its military power The region as a whole faces a loss of 3 6 million males in the most active military ages of 20–34 Between 1940 and 1970, the group 15–19, from which recruits are drawn, will decline by 30 percent

War losses will undoubtedly speed the declines and check the gains. The brunt of military casualties will fall on the group aged 45–64 in 1970—hence the older labor force of that date Persons aged 15–44 in 1970 who will constitute the younger labor force and the military contingents were under age 15 or not yet born in 1940. A rise of post-war fertility rates above the levels projected would increase this group in 1970. However, it can do so only at the youngest ages In view of the present mobilization of men, it is unlikely that there will be any net gain of the birth contingents over that projected prior to 1945 Gains in births between 1945 and 1950 will swell the group aged 20–24 in 1970. However, these gains must be made from a generation of parents depleted with war losses They will be difficult to achieve. It is unlikely that events of the post-war period can result in any substantial increase in the military and young worker contingents projected for the 1970 population of Northwestern and Central Europe.

It is not unlikely that birth rates will move above the levels projected for the post-war period. The projections assume a continuance of pre-war trends Faced with a realization that even the pre-war levels of fertility would result in progressive declines of population ranging as high as 30 percent per generation, the nations probably will make strenuous attempts to reverse the trend Strong pro-natalist programs were already established in France, Germany, Sweden, and other countries before the war. The Beveridge report and current ministerial pronouncements in Britain indicate active government planning to increase the size of families after the war. There is not sufficient experience to tell us the prerequisites of a successful pro-natalist program. It seems likely that a long-range pro-natalist policy will require a framework of economic and political security, and a new emphasis on human values Society will certainly have to be reoriented toward the interests of children, probably detracting somewhat from the current preoccupation with the needs of the aged. Probably it will have to be less oriented toward strictly individualistic values, and more toward those of the group. Such a development might easily lead toward a new rise of nationalism. If successful pro-natalist policies should yield an increase in births, the burdens of the dependent groups would be large, for the increase in the young ages would be added to that inevitably coming in the old. Meantime such policies would have almost negligible effect on the working and fighting contingents between now and 1970. The fact is that Northwestern and Central Europe's period of youth is over; its time of growth is past.

SOUTHERN AND EASTERN EUROPE

The projected population changes for Southern and Eastern Europe contrast sharply with those for Northwestern Europe, and yield a different set of problems As may be seen from the middle panel of figure 4, the principal characteristic of the period 1940 to 1970 is a rapid increase in the persons of working ages Without war losses, the projections indicate a gain between 1940 and 1970 of 32 millions (or 31 percent) in the population 15-64 years of age, and a net decline of 5 millions in the remaining age groups This increase in the ratio of producer to dependent groups will be an element of great strength if the producers can be effectively utilized.

The difficulty lies in the effective use of a growing number of workers in a region already suffering from pressure of population on its predominately agricultural economy The problem is particularly acute in the East This section of Europe is characterized by severe congestion on the land, small holdings, and low yields It faces a projected increase of 20 million persons of working age (36 percent) between 1940 and 1970 Obviously, the war will reduce that number. In some sections of the area the losses have already been terrific Such losses will not solve the problem. There will be a corresponding reduction of resources through the war's depletion of soils and destruction of capital and economic organization Smaller increases in the labor force will have to be met with smaller resources. A solution of the problem is essential to the peace of Europe. Otherwise, mounting pressure for economic opportunity is certain to lead to strife in this region of intense hatreds between widely divergent and hopelessly interlaced ethnic and religious groups If the problem is solved, the region will become one of increasing power, and after 1970 its growth should be relatively slow.

THE U S S R

By contrast with the other regions, the Soviet Union faces rapid growth in all sections of its population over age five The magnitude of its projected increase is clearly shown in the right-hand panel of figure 4. The projections indicate an increase between 1940 and 1970 of 12 millions in the ages of dependency, but of 66 millions (or 63 percent) in the productive ages. In the most active military ages, 20–34, they show males increasing by 11 million to yield a total of 32 millions by 1970. The same group in Germany decreases by half a million to yield a total of only 8 millions by 1970

Lest the projected increases seem fantastically large, it should be pointed out that they are derived by the same procedures as those for the other countries. The basic data are less complete and reliable, but my colleague, Dr Frank Lorimer, has managed to piece together what we believe to be an essentially accurate picture of the situation as of 1940. In constructing the projections, we have allowed for a rapid decline in mortality, but for one no more rapid than that which has occurred in the past under as poor initial conditions We have also projected a decline of fertility much more rapid than that for non-Soviet Europe, in conformity with the evidence that fertility declines most rapidly where it is highest

The projections, as usual, provide for no war losses, and those losses undoubtedly have been terrific both in combatant and in non-combatant groups. In all probability the increase in population will be less than that projected Perhaps the increase between 1940 and 1970 will be only 50 millions. In this connection we should point out that the rate of increase projected is about the same as that which occurred between 1900 and 1940 in spite of the tremendous losses from war, revolution, counter-revolution, and famine It should also be remembered that the U S S R, by fostering a rapid development of public health, may better the projected improvement in mortality, and that by its policy of state provision for child care and training may avoid the rapid drop of fertility experienced in the West In any case it is clear that there will be a tremendous growth of people in the U S S R

In all probability this growth in population will be matched with a growth in power The Soviet Union has ample natural resources to support her prospective population within her present boundaries During the past twelve years she has made the most rapid progress in industrialization that the world has seen The war has injured her terribly, but she has the technical skills, the resources, and the manpower to repair her losses and to go on to new and spectacular gains It is difficult to escape the view that in the coming decades the Soviet Union will be the strongest single power in the world.

IMPLICATIONS FOR INTERNATIONAL POLICIES

It is the modern fashion for the scientist to profess disinterest in the application of his findings However, I should like to exchange the present fashion for an earlier frankness It seems appropriate to do so in a group so closely linked with the memory of Benjamin Franklin, who never hesitated to point out the bearing of population change on national policy Once the war is won, the major problem will be that of achieving a just and durable peace. That problem will not be solved by doing now what we should have done in 1918 The world has moved on since then Our task is not to prevent this war, but the next one, not the belated solution of past problems, but the prompt solution of present and emerging ones No peace will be either durable or just which attempts to stem the tide of demographic change. We must recognize that the Western World, of which we are a part, is nearing the end of one demographic epoch, and is at the beginning of another National and international policies feasible in the one are not suitable to the other It is to the emerging demographic realities that our policy must be adjusted Among those realities the following seem especially important

(1) Northwestern and Central Europe is at the end of its rapid growth in people and in power In a peaceful world it has the possibility of developing a very high level of living In war, none of its nations singly, and probably no combination of them, can longer make the world dance to its tune

(2) Eastern, non-Soviet Europe faces a critical thirty-year period in which there will be constant danger of pressure of population on developed resources Such pressures must be relieved in this region of deep hatreds if strife is to be avoided. Prompt relief can come from two sources. First, the region may be absorbed by the Soviet Union, which has ample resources and an enviable record in dealing with ethnic heterogeneity If it is, the solution of the demographic problem may be rapid Or, Western powers may make an economic and political solution possible They will not if, through a tender regard for minority rights, they set up a series of small sovereign states Such states would be able to serve only as poor markets for manufactured goods, and as sources of raw materials and of more and poorer human beings. The solution

lies in the creation of a wide trade area of relatively free migration into which outside capital and skills are brought to foster industrialization and urbanization Without heavy emigration, only an urban and industrial development can provide economic opportunity and foster higher levels of living It is only in such a relatively prosperous cosmopolitan urban context that additional growth can be accommodated, the transition to low birth and death rates be achieved, and ancient provincial enmities gradually be removed

(3) A third and analogous reality, but one outside the proper scope of this paper, is the demographic development of large regions in the Far East The problems are of longer range and ultimately more serious, but involve the same underlying principles A modicum of modern sanitation and police work has permitted a tremendous growth of peoples In some areas the spread of industrial techniques will bring these people power Broadly speaking, the nations of the West have two choices that of sitting on the lid as long as possible, in the substantial certainty of being blown off eventually to face well-earned animosities, or that of fostering a social, economic, and political development of these areas which will release some of the pressure of population on developed resources and ultimately check the rapid growth of peoples

(4) Finally, the most important reality of all is that the Soviet Union, given a little political luck, will be the strongest single power in the world, and will occupy a dominant position on the Eurasian Continent She will be too big to beat Perhaps she will be weary enough and sufficiently confident of her great future not to be overly truculent

These are the demographic realities with which Western nations must cope. To do so will require wise policy in both the domestic and the foreign fields At home the nations of Western Europe must eventually find means for checking the progressive decline of their child populations —means which are compatible with human dignity and individual freedom Otherwise they face either a progressive decline in numbers or the loss of values for which they seek to live It seems likely that a pre-condition for success lies in a new emphasis on human values within a framework of economic and political security In the international field, the nations of Western Europe will have to depend on some form of collective security If it is to last, such collective security must be broadly based on the mutual self-interest, not only of a limited membership, but of the community of nations It will have to be one to which the Soviet Union, in spite of ideological differences, will at least not be antagonistic, and one to which the backward areas of the world can look for mutually profitable assistance It will have to be one which provides the mechanism for peaceful change in a dynamic world

The United States could stand apart from such an association It could not do so wisely, for our power and relative detachment is essential to the development of any collective security not strictly tied to Soviet leadership Moreover, in the long run we are in the same line of demographic development as Western Europe and face the same world, at longer but narrowing range From a demographic and technological point of view it is too late for us to rule the world It is not too late, but soon will be, for us to join with Western Europe in teaching ourselves and the world the advantages of co-operation within a framework of enlightened self-interest.

PANAMA CANAL REVENUES AND FINANCES

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The investigation of government aids to transportation, and the reports thereon, made for the Coordinator of Transportation for the period ending with 1936, and those that are being made by the Board of Investigation and Research and that will bring the data to 1941, have raised the questions as to whether the Panama Canal is a self-supporting facility, or whether those who use it for the transiting of vessels, or for other purposes, are being subsidized by the government. Does the government's net income from the Canal enterprise cover operating expenses and capital costs, or does the government bear a part of the cost of performing the services rendered for those who use the Canal?

The staff of the Board of Investigation and Research prepared, and the Board, in 1942, issued, a "preliminary statement," Exhibit W-15, entitled "The Panama Canal, Financial Results of Operation." The Exhibit contains the statement that for the five-year period, 1937-1941, the average rate of return upon the average investment in the Panama Canal was 2.179 percent, or .821 percent less than 3 percent per annum. Moreover, the revenues upon which this rate of return is based include, in addition to the tolls and other revenue actually received, the amount that would have been received had the war vessels of the United States Government and the vessels of the Republic of Panama, that are accorded free transit, paid tolls equal to those levied upon other vessels. Even with the revenues thus increased by adjustment, the receipts of the government were found to be $15,920,000 less than the amount required for the payment of 3 percent per annum upon the investment. The cargo carried through the Canal during the five-year period having been 135,610,733 tons, there was a Federal subsidy amounting to 11.74 cents for each ton of cargo. The government thus bore a part of the cost of transportation. The statement in the Exhibit, however, explains that "The computed deficit, it should be noted, is a deficit based upon the earnings and expenses of the Canal transit property, and the civil and administrative operations," in the Canal Zone. In other words, there are two divisions of the Panama Canal enterprise whose operations, investment, earnings, expenses, and net income are not included in the foregoing calculation of the Canal's net income and rate of return upon investment. The other two divisions of the Canal enterprise are the "business property" and its operations, and the properties operated for the Canal Administration by the Panama Railroad Company. The significance of regarding the Panama Canal enterprise, as a whole, as one enterprise in considering investment, earnings, expenses, and net return will be made evident by the discussion that follows.

The "preliminary statement" concerning "the Panama Canal financial results of operation" raises the question as to whether the Panama Canal, as a commercial enterprise, was or was not upon a self-supporting basis before the traffic using the water-way was temporarily much reduced by the present World War. After the World War has ended, and commerce is again of normal volume and has its usual rate of increase, the determination of the financial policy to be followed in the administration of the Panama Canal will be one of the many post-war decisions to be made by the government of the United States. The making of a wise decision as to a future Panama Canal financial policy will depend upon a correct understanding of what the pre-war policy was, and of the results produced, as regards gross and net revenue and income upon capital investment. Was the Panama Canal a self-supporting commercial enterprise when the World War began? Can and should it be self-supporting after the war ends? Will it be possible and advisable to put the canal, as a commercial facility, upon a self-liquidating basis by providing for the amortization of the investments from annual earnings? Some assistance in deciding upon the correct answer to these questions should be given by a statement and analytical discussion of the gross and net investment in the Panama Canal as a commercial enterprise, of what the gross revenues are, what is and should be included in expenses, and what

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 2, AUGUST, 1943

the net income, or return upon investment, has been. Such are the purpose and character of the statement and discussion that follows.

WHAT DOES NET INVESTMENT INCLUDE?

The rate of return upon any investment, obviously, is dependent upon the method followed in determining the amount of the investment, and upon what is included in net income The amount of investment in the Panama Canal "transit" and "business" properties (not including the properties operated by the Panama Railroad Company) in July, 1920, when the period of construction officially ended, and the amount of the investment at the beginning of each subsequent fiscal year, are stated in the annual report of the Governor of the Panama Canal Those who made the investigation for the Coordinator of Transportation, and those who prepared the Exhibit W-15 for the Board of Investigation and Research, accepted without change the amount of investment, as of 1921, as calculated by the Canal authorities, but, as will be explained later, these investigators calculated the net investment for subsequent dates by different principles or methods than those adhered to by the Canal authorities

Another group that calculated the investment in the Panama Canal enterprise and the rate of return upon the investment was the Committee on Panama Canal Tolls and Vessel Measurement Rules that was appointed in 1936 to investigate tolls and tonnage rules and to recommend such changes as were found to be advisable This Committee, which made its report early in 1937, found that the net investment in the Panama Canal enterprise was substantially less than the amount as determined by the Panama Canal Authorities By the method it followed, which will be explained presently, the Committee found that the net investment, less accrued depreciation, as of 1936, was $475,214,870 for the Canal enterprise as a whole, including the Canal proper, the business activities connected therewith, and the Panama Railroad and the activities conducted by the railroad company.

The foregoing references to net investment in the Panama Canal enterprise are to the amount of investment less depreciation—less accumulated depreciation in the case of the property invested in the transit and Zone administration facilities, and less depreciation reserves, as regards "business property" and the properties owned or operated by the Panama Railroad Company To the extent that property is worn out or becomes of less value as the result of operation, depreciation is an expense that should be met annually and be charged against the yearly operating income, if the enterprise in which the investment has been made is to be self-supporting, *i. e* the annual operating income must be sufficient to cover operating expenses and maintenance, and also normal annual depreciation Current depreciation expenses should include such necessary improvements to existing plant as will keep it from deterioration. Outlays incurred in making additions to the plant and facilities—such as additional locks, an additional dam, power plant or terminal—would be added to the gross and net capital investment Expenses, including annual depreciation and normal plant and equipment renewals, having been met from gross operating income, there should remain a net income sufficient to pay a fair rate of interest upon net investment For a government enterprise, 3 percent per annum may be considered a fair rate of interest at the present time

To repeat, current depreciation should be met from current income derived from the operation of the property in its present status To the extent that depreciation in the past has not been covered by past income there has been a loss of gross investment To determine whether the Panama Canal is now receiving and will receive adequate revenues, we must find out the amount of the investment in the present property, and we also need to ascertain how much must be spent year by year to keep the present property in efficient condition by necessary repairs and renewals.

HOW GROSS AND NET INVESTMENT HAVE BEEN CALCULATED

The gross and net investment that the government and people of the United States have made in the Panama Canal enterprise has been investigated and reported upon by four government authorities. The methods and results of the four investigations differ in several particulars

The source of information as to the investment in the Panama Canal to which one turns first of all is the annual report of the Governor of the Canal. Inasmuch as two of the four reports upon investment in the Canal enterprise do not contain data for a later period than 1936, it will be well to state first the amount of investment as presented in the 1936 and 1937 annual reports of the Governor of the Canal Reference will also be made to the data in later reports of the Canal authorities The 1936 Report of the Governor of the Panama Canal states that the gross capital investment without deduction of depreciation, as of June 30, 1936, in the Canal and its business activities, not including the Panama Railroad and other properties operated by the railroad company, was $549,874,826 The Canal authorities are careful not to include the investment in the properties managed by the railroad company. Had the gross capital investment in the Panama Railroad and associated properties been included, the gross capital investment (without deduction of accrued depreciation and reserves), as calculated by the Canal accountants, would have been $601,675,055 in 1936

In 1937 the Canal authorities made a change in their accounting system that reduced substantially the gross capital investment in the "Canal transit" property, and the "business properties" included in the statement of Canal investment made by the Canal administration. The Report of the Governor for 1937 states

> Pursuant to studies made in connection with the investigation of tolls made by the Committee appointed under authority of Act of Congress approved April 13, 1936, certain changes in the Canal accounting system dealing with the change in the date of completion of the Canal for the purpose of computing interest on construction costs, and in connection with deduction of accrued depreciation from gross capitalization before calculating interest on investment in arriving at operating results, were submitted to the President for approval.

The President approved the proposed changes in accounting. The date that had formerly been taken for the end of the Canal construction period, June 30, 1921—the end of the fiscal year 1921—was changed to July 11, 1920 This resulted in the reduction of the amount of compound interest on capital advances during the period of construction from $143,652,360 to $128,991,063. Two other deductions in capital investment were also made by the Canal accountants. The annual payment, which was then $250,000, to the Republic of Panama for the Canal Zone concession was changed from the capital to the operating account; and the accrued depreciation, as of 1936, of Canal transit property and business equipment, $28,116,952, was deducted from gross capital investment These deductions bring the net investment in the Canal enterprise, not including the several properties operated by the Panama Railroad Company, down to $506,846,576 for the year beginning July 1, 1937 This total does not include the investment in the Panama Railroad and associated properties operated by the Panama Railroad Company, which in 1937 had a net investment, less depreciation reserves, of $24,882,520, making the 1937 net investment in the Canal enterprise as a whole $531,729,096, according to the accounts of the Canal authorities

The Committee on Panama Canal Tolls and Vessel Measurement Rules appointed by the President in July, 1936, to make an investigation of Panama Canal tolls and tonnage rules and to recommend changes that were advisable, found that the net investment, less depreciation in the Panama Canal as a whole as later calculated by the Canal authorities, was $535,037,030 in 1936 The method followed by the Committee in determining gross and net investment differed in several particulars from the method followed in the accounts of the Canal authorities The Committee sought to ascertain what was the *net outlay* that the American people had made for the Canal enterprise as a whole Considerable sums had been invested in the enterprise from the net earnings of the Panama Railroad Company The government had also regularly received dividends on the stock of the Panama Railroad, all of which stock is owned by the government The Canal authorities have insisted upon considering the Panama Railroad Company and its activities as a separate enterprise Being a corporation, the railroad company does not have to turn its revenues into the United States Treasury Thus the disposition of surplus revenues is controlled by the company and not by Congressional action The Canal authorities, who are the directors of the railroad corporation, also fear that, if the net earnings of the railroad company and its several activities are regarded as a part of the net income of the Canal enterprise, Congress may cut down the appropriations made for the operation, maintenance, and improvement of the Canal

As has been stated, the interest on capital advances during the period of construction, as calculated by the Canal accountants, was $128,991,063 This was the amount resulting from applying compound interest The Committee on Tolls and Vessel Measurement Rules thought that simple interest should be paid on withdrawals from the United States Treasury. Thus reckoned, the interest on capital advances up to July 11, 1920, was $114,816,630

The principle to which the Committee on Tolls and Vessel Measurement Rules adhered in its calculation of the net investment in the Panama Canal enterprise in 1936, the date of the Committee's investigation, is stated as follows in its report

> As the result of the net outlay that has been made the people and the Government of the United States have the Panama Canal and railroad property in its present condition It is that property that is now being used for the services that are being rendered and for which charges are levied
>
> The present net investment (in the canal enterprise as a whole) is the total payments from the United States Treasury less the present amount of depreciation (most of which has been offset by allotments to depreciation funds) and less the amount of profits from operation that have been put into the property or that the United States Treasury has received as dividends paid from the net income It is this net outlay for the Canal enterprise as a whole upon which the Government should receive interest

The accounts as kept by the Canal authorities state that the gross capital investment, less accrued depreciation, as of June 30, 1936, in Canal properties, other than those operated by the Railroad Company, was $506,846,576 60 If to this be added the $42,114,886 26 of gross investment, less depreciation, in the properties operated by the Railroad Company, the total for the Canal enterprise as a whole becomes $548,961,462 86, as reckoned by the Canal accountants The corresponding total as calculated by the Committee on Tolls and Vessel Measurement Rules was $535,037,030 64, most of the difference in the two totals being due to the fact that the Committee computed simple interest, and the Canal accountants compound interest, on capital advances during the period of construction

From the gross investment, less depreciation, in the entire canal enterprise, as of June 30, 1936, of $535,037,030 64, as calculated by the Committee on Tolls and Tonnage Rules from the records of the Canal authorities, the Committee made three deductions to determine the net property investment which the people of the United States had in the Canal enterprise as of that date—the amount upon which they should receive a fair rate of return These three deductions were

1 The dividends, amounting with simple interest at 3 percent to June 30, 1936, to $14,181,666 65, that the Panama Railroad Company had paid into the Treasury of the United States
2 The $36,051,743 50 that the Panama Railroad Company had put into its surplus funds from its net earnings, which surplus was invested in the property that is owned by the railroad company but is a part of the Canal enterprise as a whole
3 $9,588,750 ($5,500,000 with interest at 3 percent to June 30, 1936) which is the additional cost that was incurred in making the Canal locks 110 feet instead of 100 feet wide to carry out a recommendation of the Navy Department

Those three deductions, amounting to $59,822,160 made the *net* investment as determined by the Committee to be $475,214,870, as of June 30, 1936 It was this net investment as it might be increased or decreased year by year that should be supported by the net revenues of the Canal enterprise as a whole To be self-supporting the Canal enterprise must have net revenues sufficient to pay 3 percent per annum upon the net investment The gross revenues must be sufficient to meet operating and maintenance expenses and to cover annual property depreciation, including normal replacements and betterments

The Canal authorities in 1936 (and the practice has been maintained to the present) included in their account of yearly Canal expenses an unfunded reserve, that is paid into the United States Treasury, of $1,200,000, to cover "depreciation on Canal general property" In estimating the necessary revenues of the Canal enterprise, the Committee on Tolls and Vessel Measurement Rules included in annual expenses "a regular depreciation reserve of $1,500,000 for Canal property, other than business properties and property of the Panama Railroad Co ," and a "surplus fund for normal replacements and betterments starting with" $2,000,000 That Committee realized that the requirements for betterments and replacements might not be adequately met by an annual allotment of $2,000,000 and suggested that, if found necessary, the fund "might well be increased with the growth in Canal traffic and revenues, with a view to making the annual allotment $3,000,000 by the end of a decade" Thus the Committee thought of the necessary and regular Canal expenses as including operating expenses and funds to cover general property depreciation and normal replacements and betterments of dwellings, buildings, and other like structures that are certain to deteriorate year by year. The Committee's allotment as an annual expense for what is ordinarily included in depreciation was a sum starting with $3,500,000 to be increased if necessary to $4,500,000 by the end of a decade.

To meet expenses, thus defined, as they had developed up to 1936 and as they might normally increase, and to provide annual net revenues that, with other net income, would amount to 3 percent upon the actual net investment in the Canal enterprise as a whole, the Committee on Tolls and Vessel Measurement Rules recommended a schedule of tolls that it was thought would be adequate, when levied against the probable future tonnage of vessels using the Canal. The tolls and vessel measurement rules recommended by the Committee were approved by the President, were authorized by Congress, and were promulgated by executive order to become effective at the end of six months, *i.e.*, March 1, 1938. The toll charges and the tonnage rules were such as it was thought would, under normal peace-time conditions, yield the gross and net revenues required to make the Canal, in the future, self-supporting as a commercial enterprise. There was and is general agreement that the military expenditures and expenses at the Canal are not to be a charge against those who use the canal as a commercial facility.

To make the Panama Canal enterprise self-liquidating as well as self-supporting the tolls and revenue would have to be sufficient to provide for the amortization of the investment in the enterprise. The Committee on Tolls and Vessel Measurement Rules did not recommend providing for the immediate beginning of amortization, but the Committee thought that "the increase in the net revenues of the Canal enterprise as a whole during the next decade or two will justify the adoption of a plan of amortization." The subject of amortization will be referred to again in considering the financial problems of the present and future.

The Coordinator of Transportation, during the three years, 1933–36, of his service, started an investigation that resulted in a detailed four-volume Report on Public Aids to Transportation. A part of the third volume discusses the capital investment, revenues, expenses, and net revenues of each of the three divisions of the Canal enterprise, *i.e.*, the "transit" property, the "business" property, and the Panama Railroad with its associated properties. The report presents data for each year from 1922 to 1936 inclusive. The investigators who prepared the report for the Coordinator accepted the official statement of the Canal accountants as to investments as of 1921, including compound interest on the funds advanced during the period of construction ending in 1920. However, the net investments, as determined by the Coordinator's staff, are less than those presented in the annual reports of the Governor of the Canal. The difference between the amount of present net investment as stated in the report of the Coordinator's staff and in the Governor's Annual Report is due mainly to two causes: the Coordinator's report makes larger annual deductions for depreciation of Canal "transit" property, and also includes in annual expenses a charge for the amortization of the investment.

As has been stated, the accounts kept by the Canal authorities include in the statement of Canal expenses an unfunded sum for depreciation of Canal general property. In 1936 this unfunded expense item was increased from $1,006,625 to $1,200,000, at which figure it has since remained. As has been noted, the Canal accountants, in the Governor's Report for 1937, accepted the suggestion of the Committee on Tolls and Vessel Measurement Rules and stated what the amount of capital investment would be, after deducting $28,116,952 of accrued depreciation. This with the other adjustments, as above noted, would make the net investment less depreciation, as of June 30, 1936, not including the properties operated by the Panama Railroad Company, $506,846,576. As the result of an engineering survey, the Canal authorities, in 1937, made some adjustments in their accounts. Beginning with 1937, the Annual Report of the Governor of the Canal states the amount of accrued depreciation for property other than the railroad company properties. The accrued "Canal depreciation" to July 1, 1937, less retirements for that year, was $20,209,165.86, the "plant depreciation" (less 1937 retirements) was $10,284,898.39, the total for the two classes of property being $30,494,064.25. As calculated by the Canal authorities, the capital investment in the "Canal" and "plant" (other than the railroad company properties) was, on the 30th of June 1937, $538,160,472, less $30,494,284 of accrued depreciation, the net capital investment being $507,666,408 By June 30, 1941, the accrued depreciation had increased to about $38,778,000, but, owing mainly to expenditures thus far made upon canal defense property and upon the third set of locks that is being constructed, the capital investment had risen to $593,202,000, and the net capital investment had become $554,424,000

The consideration to be given depreciation in determining net earnings will be discussed later, but, in this connection, attention may be called to the difference in accrued depreciation, up to July 1, 1936, as calculated by the Canal authorities and by the staff of the Coordinator of Transportation The Canal accountants found the amount of accrued depreciation, on that date, for the Canal general property, other than "floating plant and business property," to be $19,411,111, while the corresponding total as stated in the Coordinator's report was $70,955,459 This wide difference was due mainly to the fact that the Coordinator's staff applied depreciation to a large amount of fixed property which the Canal authorities did not consider to be subject to depreciation The accrued depreciation, as calculated by the staff of the Board of Investigation and Research, was practically the same as the amount stated in the report of the Coordinator

The Board of Investigation and Research in the tentative report upon "The Panama Canal, Financial Results of Operation," Exhibit No W-15, does not contain a statement of the investment in the Canal property for 1936, but the amount of the net investment, less depreciation, is stated for each of the five years 1937–1941. The following table contains the figures for the amount of net investment, less depreciation, but without amortization for the years 1937 and 1941, as presented in Exhibit No W-15, for the three general categories of property included in the Canal enterprise as a whole

	1937	1941
Canal transit or general property less depreciation	$443,166,406	$409,447,431
Business property, less depreciation reserves	22,988,691	27,900,703
Railroad Company operated properties, less depreciation reserves	24,682,520	36,459,657
Total	$490,837,617	$473,807,791

The Report of the Coordinator of Transportation does not contain data beyond 1936, but states the amount of the net investment in the three parts of the Canal enterprise for each year from 1922 to 1936 The 1936 net investment, without reduction for amortization, was as follows

Canal transit or general property, less depreciation	$443,168,025
Business property, less depreciation reserves	26,649,131
Railroad Company operated properties, less depreciation reserves	24,867,463
Total	$494,684,619

It may be noted that the totals for net investment, less depreciation, in the Canal enterprise as a whole, as stated in the tentative Report of the Board of Investigation and Research, for the years 1937 and 1941, and in the Report of the Coordinator of Transportation, for the year 1936, although differently determined, do not differ greatly from the total net investment of $475,214,870 as determined by the Committee on Panama Canal Tolls and Vessel Measurement Rules

The foregoing details as to the net capital investment in the Canal enterprise as a whole -gross investment less accrued depreciation for the "Canal transit property," and less the depreciation reserves for the "business properties" and for the properties operated by the Panama Railroad Company -have been presented as the necessary prelude to a consideration of net revenues and the rate of return upon investment Before subjecting the details as to net earnings to analysis and revision, it may be stated that the accounts of the Canal authorities show that the net revenues, for 1936, from (1) Canal transit operation and Canal Zone Administration, plus (2) the profits upon the business operations of the Canal, plus (3) the profits from the properties operated by the Panama Railroad Company, were $16,529,826.84, which would be 3 percent upon an investment of $550,994,228. At the beginning of the fiscal year 1939, the last year before normal conditions were disrupted by the outbreak of the present World War, the total capital investment was $535,975,675 62, and the 1939 net revenues were $16,004,190 17, which was 2 98 percent of the investment When the World War began in 1939, the traffic of the Panama Canal and the revenues from tolls fell off; and, although the net revenues of the "business operations" and of the railroad company's operations were larger in 1940 and 1941 than they had been in 1939, the net revenues from the Canal enterprise as a whole, as calculated by the Canal authorities, decreased and by 1941 had fallen to $12,506,451.81, which would be 3 percent of $416,881,727. For the five-year period 1937-1941 inclusive, the total net revenues of the Panama Canal enterprise as a whole, thus calculated, were $74,338,225.70, the annual average for the five years being $14,867,645, or 3 percent of $495,588,167.

Treatment of Annual Depreciation and Amortization as Part of Annual Expenses

If the foregoing data told the whole story, the determination of the amount of the annual net income available for the payment of interest, year by year, upon the amount of the net property investment would be a relatively simple matter. However, there are two other factors that must be considered, and they complicate the problem to be solved. One factor or question is whether and in what amount should the annual depreciation of property be added to expenses and be deducted from gross revenue year by year. In other words, should the annual gross revenue be sufficient to cover normal operating and maintenance expenses and to provide funds equal to the amount of property depreciation, such funds to be invested in the property, or set aside as reserve funds, or be paid to the owner or owners of the property, the owners of the Canal enterprise being the people of the United States represented by the treasury of their national government? The general answer to this question is easily made, the revenues should be sufficient to cover property depreciation to protect the owners against a loss of investment.

The other complicating factor to be considered is whether the revenues obtained from the operation of such a property as the Panama Canal should provide for the amortization, over a period of fifty, seventy-five, or a hundred years, of the fixed or "non-depreciable" property, which, as shown by the accounts of the Canal authorities, comprises more than 70 percent of the Canal transit and business properties. In the Report on Public Aids to Transportation prepared for the Coordinator of Transportation, and also in Exhibit No. W-15 issued by the staff of the Board of Transportation and Research, an annual charge covering "amortization of investment in non-depreciable property" is included in annual expenses and is deducted from gross revenues. The accounts kept by the Canal authorities do not include amortization in annual expenses; and the Committee on Panama Canal Tolls and Vessel Measurement Rules, as has been stated, did not recommend providing for the immediate beginning of the amortization of investment.

In discussing the amount of annual depreciation to be included with other expenses and to be deducted from operating revenues to ascertain the amount of net revenue available for the payment of interest upon net capital investment, it will be well to take the fiscal year ending June 30, 1939, the year before the traffic and earnings of the Canal had been much affected by international turmoil. The sources of information for the fiscal year, 1939, are the Annual Report of the Governor of the Canal and the Exhibit No. W-15 prepared by the staff of the Board of Investigation and Research.

As set forth in detail in the "financial and statistical statements" comprised in Section V of the 1939 Annual Report of the Governor of the Canal, the Canal expenses, not including those for "business operations" and for the operations carried on by the railroad company, were $13,660,979.07, which included an unfunded sum of $1,200,000 for "depreciation on general property." The net revenues of the Canal, other than those for "business" and "railroad company" operations, less the expenses (gross revenues of $27,502,050.26 – $13,660,979.07), were $13,841,071.19. The net revenues from "business operations" in 1939 were $681,272.48, the amount of "investment less depreciation reserve" being $25,314,041.87. In the management of "business properties" the expenditures to offset depreciation of plant and equipment can be included in expenses and deducted from gross revenues. Large depreciation reserves are maintained. The percent of return on investment is the percentage which net revenue is of investment less depreciation reserves. Accompanying the table itemizing "business expenses, revenues, and profit and loss" contained in the annual reports of the Governor of the Canal, is the following statement (italics added):

> Business operations of the Panama Canal are conducted separately from operating activities pertaining to the transiting of vessels and the government of the Canal Zone. The annual appropriation acts (of Congress) for the Panama Canal authorize the

> use of appropriated funds for the conduct of auxiliary business activities, *provided that funds so advanced are recovered through earnings, and with further proviso that any net profit derived from such business activities be covered annually into the United States Treasury*

The Panama Railroad Company functions as a corporation, and the operations in connection with the Panama Railroad include the Panama Railroad, and the harbor terminals, the steamship line operating between Panama and the United States, and "outside operations" In connection with each of the several operations—railroad, harbor terminal, steamship, and "outside operations"—a depreciation reserve is maintained These depreciation reserves in 1939 totaled $11,220,142, which sum deducted from the investment, as of that date, left an "investment less depreciation reserves" of $35,783,397 31, upon which a net income of $1,481,847 10 was earned

As has been stated, the Canal authorities reported a net revenue, for the fiscal year 1939, from Canal transit operation and Canal Zone Administration, of $13,841,071 19, from business operations, $681,272 48, while the net revenues from railroad company operations were $1,481,847 10, thus making the total net revenues from the operation of the entire Canal enterprise $16,004,190 77 In deciding whether this net revenue made the Canal enterprise self-supporting in 1939, we need to give further consideration to the manner in which depreciation is dealt with by the Canal authorities in determining net investment and net revenues. The accounting practice regarding depreciation is stated as follows in the annual reports of the Governor of the Canal

> Depreciation of depreciable property and equipment is charged to operations at accepted rates, the amounts so charged being accrued in offsetting valuation or depreciation reserve accounts Using account balances as of the beginning of the fiscal year, accrued depreciation is deducted from gross capital to establish the investment upon which interest return is calculated.

The account of annual expenses of Canal transit operation and Zone Administration includes the unfunded sum of $1,200,000. This unfunded sum less the annual retirement of property had reached $21,487,543.04 during the period from July 12, 1920, to June 30, 1939 There was also an accrued floating plant depreciation for the same period of $4,007,271 15; the amount of such depreciation, for 1939, less retirements, was $225,613 33, which was included in operating expenses. The accrued depreciation of business fixed property and equipment for the period 1920–1939 was $8,647,036 38; the amount, for 1939, less retirements was $689,093 78 As has been explained, the Canal authorities, in the management of the "business property," are permitted to maintain depreciation reserves fully offsetting depreciation These accrued depreciation totals, as of 1939, for "canal," "floating plant," and "business property," amounted to $32,347,325.33 The Canal authorities state the amount of gross capital investment in the Canal transit, Zone Administration, floating plant, and business property (the property of the Canal enterprise less the property managed by the railroad company) to have been $540,694,147 73, at the beginning of the fiscal year 1939, and that the investment, less accrued depreciation, June 30, 1938, was $508,346,822 50 If to that be added the investment, less depreciation reserves, in the Panama Railroad, and Steamship Line and other properties managed by the railroad company, $27,628,853 12, at the end of the fiscal year 1938, the net investment in the Canal enterprise as a whole at the beginning of the fiscal year 1939 was $535,975,675 62 The net revenues from the Canal enterprise as a whole having been $15,934,860 75, the interest return earned on capital investment during the year ending June 30, 1939, was 2 98 percent

If the gross and net investment in the Canal enterprise, as determined by the Panama Canal authorities, be reduced by the amounts that would be subtracted by following the method adopted by the Committee on Panama Canal Tolls and Vessel Measurement Rules, the net amount which had gone into the Canal enterprise up to the beginning of the fiscal year, 1939, i e the investment upon which the government should have received 3 percent interest in 1939, is lowered from $535,975,675 to $460,664,753 The deductions are the difference between simple and compound interest on advances during the construction period up to 1920, $14,175,429; the costs, with simple interest to 1938, of giving the original locks a width of 110 feet, instead of 100 feet, for naval reasons, $10,083,750, the dividends with simple interest, paid the government up to 1938 on the stock of the Panama Railroad Company, about $15,000,000; and the $36,051,743 of surplus earnings which the Panama Railroad Company had invested in its property up to 1936. Upon a net investment of $460,664,753 at the beginning of the fiscal year 1939, the net revenues for that fiscal year as calculated by the Canal authorities would provide an interest income of 3.46 percent. This calculation deducts only $1,200,000 from revenues for "the depreciation of fixed property." If, as recommended by the Committee on Tolls and Vessel Measurement Rules, $3,500,000 (instead of $1,200,000) be deducted from revenues to provide for depreciation of Canal "transit" and Zone Administration property and for a fund for normal replacements and betterments, the rate of return on the net investment would have been 2.87 percent.

How much of the depreciation in the property of the Canal enterprise during the year ending June 30, 1939, was included in expenses? The Canal accounts included in the operating expenses of the "Canal property," other than "business property," the usual unfunded item of $1,200,000. The accounts of the operations connected with "business property" show that depreciation reserves were not only maintained but were increased by $815,428.88 during the fiscal year ending June 30, 1939. During the same year the depreciation reserves of the properties operated by the railroad company were increased by $513,619.55. Apparently the only question is whether the depreciation in the Canal transit and Zone Administration property (the "Canal property") is covered by charges against earnings. As to this question there is a difference of opinion arising from different views as to what is to be included in depreciable property and the rate or rates at which depreciation should be reckoned.

In the Coordinator's Report on Public Aids to Transportation the statement is made that "cognizance is taken by the Governor (of the Canal) of all cost factors though the accounts set up for depreciation appear in the aggregate to be inadequate." In Exhibit No. W-15 of the Board of Investigation and Research there is the statement "Whether depreciation charges currently applied by the Canal authorities are adequate to reflect the wastage of assets is a problem on which there would likely be no general agreement." Each annual report of the Canal authorities contains a tabular statement of the "depreciable" and "nondepreciable" properties included in capital assets. In the report for 1939 the several kinds of "Canal general property" listed as depreciable have a total value of $102,811,736 while the entries under nondepreciable amount to $391,278,368. The Canal authorities state in their annual reports that "depreciation of depreciable property and equipment is charged to operations at accepted rates." Their total for accrued depreciation up to the present for Canal property (other than floating plant, business fixed property, and business equipment for which depreciation reserves are maintained from revenues), is the accumulated amount of depreciation that has been included in annual expenses.

Those who prepared the Report of the Coordinator of Transportation upon Government Aids to Transportation and the staff who worked out Exhibit No. W-15 of the Board of Investigation and Research reckoned depreciation at higher rates and upon more kinds of property than the Panama Canal officials have computed it. The Report of the Coordinator contains the following statement:

> Depreciation in the amount of $20,477,523.19 was set up as of June 30, 1937 (in the Report of the Governor of the Canal). The difference between this amount and $69,498,321.87, shown in the present study, results more from the fact that more classes of property are considered subject to depreciation accounting than from differences in rates used on property depreciated both by the Canal Authorities and in this report. It is believed, however, that for the type of analysis here undertaken more significant results are obtained by formal depreciation accounting than by dependence upon the retirement or replacement methods so largely used by the Canal Authorities.

The Coordinator's report brings the data to 1936, and according to that report the depreciation of Canal "transit" fixed property and equipment, during the fiscal year ending June 30, 1936, was $4,242,986.86, the accrued depreciation up to that time being $69,498,321.87. The Exhibit prepared for the Board of Investigation and Research states that the "computed depreciation of depreciable property" during the fiscal year 1939 was $4,158,544.82, the accrued depreciation upon "fixed property" up to the beginning of the fiscal year 1939 being $77,956,145.18. These figures as to annual and accrued depreciation, as stated in the two reports, do not include depreciation of Canal business property or of the properties operated by the Panama Railroad Company, for which properties depreciation reserves are maintained.

The Committee on Panama Canal Tolls and

Vessel Measurement Rules found the justified capitalization of the Canal enterprise as a whole for 1936 (net investment less depreciation) to be $475,214,870 49 Of that total $42,204,886 26 was included in railroad company properties, $24,625,263 09 was for business property and equipment, leaving $408,474,721 14 for Canal transit and Zone Administration property

The Report of the Coordinator of Transportation (in which data are brought only to 1936) accepts the statement of investment as calculated by the Canal authorities According to the Coordinator's report, the 1936 investment, less depreciation to date, as per Panama Canal accounts, in Canal transit and Zone Administration property, was $514,123,485 34 From this was deducted $70,955,459 85 of accrued depreciation as computed for the Coordinator's report Thus the investment less depreciation in the Canal transit and Zone Administration property in 1936, as computed by the Coordinator's staff, was $443,168,025 49

In the Exhibit No. W-15 prepared for the Board of Investigation and Research the net investment, less depreciation, in the Canal property (other than "business property" and railroad company properties) at the beginning of the fiscal year 1939 was $421,875,469 41

The annual report of the Governor of the Canal shows that the amount of investment, less accrued depreciation, in the Canal general transit and Zone Administration property, was $480,743,160 68, at the beginning of the fiscal year 1939 (July 1, 1938)

Differences in the method followed by the Committee on Panama Canal Tolls and Vessel Measurement Rules, and by the Canal authorities, in computing net investment in the Canal enterprise account for the larger total as determined by the Canal accountants The accrued depreciation, as reckoned by the Coordinator's staff and by those who prepared the Exhibit for the Board of Investigation and Research, being larger than the amount of accrued depreciation as computed by the Canal authorities, the net investment as determined by the Canal authorities is larger

The foregoing details have been presented (1) to indicate how much annual depreciation is to be included in the expenses to be deducted from the gross, to ascertain the net, revenues of the Canal property (other than "business property" and properties operated by the railroad company), and (2) to assist in determining upon what investment, less accrued depreciation, interest is to be reckoned in deciding whether the Panama Canal is self-supporting

As has been stated, depreciation of property is computed differently by those who have made the calculation The Committee on Panama Canal Tolls and Vessel Measurement Rules included in future annual expenses to be met from income $1,500,000 for the maintenance of a depreciation reserve for "Canal property" other than business properties and properties of the Panama Railroad, and $2,000,000 for a surplus fund, if found necessary, for normal replacements and betterments That was equivalent to a total of $3,500,000 annually for providing against the accrual of depreciation of "Canal property" The method followed by those who prepared the Coordinator's Report on Public Aids to Transportation would make the amount of depreciation of Canal transit fixed property and equipment, during the fiscal year 1939, $4,243,728 71, while the corresponding depreciation as calculated for the Report of the Board of Investigation and Research was $4,158,544 82

As previously noted, the Canal authorities include in annual expense an unfunded sum of $1,200,000 for "depreciation on general property" In calculating accrued depreciation upon such property the amount credited to retirements is deducted, thus the accrued "Canal property" depreciation as of June 30, 1939, was only $797,109 61 greater than on July 1, 1938 During the same fiscal year there was an increase in accrued "floating plant" depreciation of $225,618 33 The total of the increase during the fiscal year ending June 3, 1939, in accrued "Canal property" depreciation and in floating plant depreciation was only $1,022,722 94, as stated in the Report of the Governor of the Canal The large annual depreciation in "business fixed property" and in "business equipment" is offset by the maintenance from annual revenues of large depreciation reserves The net investment in "business properties" and in the properties operated by the Panama Railroad Company is the gross investment less the depreciation reserves. Depreciation is taken care of as an annual expense

To be self-supporting during any fiscal year the Canal enterprise as a whole must have net revenues sufficient to pay interest (at 3 percent per annum under present conditions) upon the amount of the net investment, and net investment at a given time means original property investment less accrued depreciation If a sum for the amortization of non-depreciable property is annually included in expenses to be paid from revenues, the net investment at a given date is the original capital investment less accrued depreciation of depreciable property and less the amount of amortization that has thus far been made from earnings The Canal authorities, in their account of earnings and capital investment, have not included amortization The Committee on Tolls and Vessel Measurement Rules did *not include amortization as* an annual charge to be included in expenses, but suggested that with the future growth of traffic and revenue it would be well to provide for the amortization of investment

Rate of Return on Investment

The Committee on Tolls and Vessel Measurement Rules computed what it considered to be the net amount of the investment, in 1936, in the Canal enterprise as a whole, and recommended such tonnage measurement rules and such rates of toll as it thought would result in future revenues sufficient to meet operating expenses, to *maintain the property in an undepreciated condition*, and to yield an annual interest return of 3 percent upon the property investment As computed by the Committee, the net investment in the Canal enterprise, as of 1936, was considerably less than the amount as calculated by the Canal accountants

Those who prepared the Report for the Coordinator of Transportation and Exhibit W-15 for the Board of Investigation and Research adopted the Canal authorities' statement of investment up to 1921, but, in computing the net investment year by year beginning with 1921, the authors of the Report and the Exhibit followed methods different from those of the Canal accountants, they calculated annual depreciation at much higher rates and they made liberal provision for the amortization of the investment in the non-depreciable property included in "Panama Canal transit" property The policy thus followed by the authors of the Report and the Exhibit has two results, it reduces the current amount of the net investment upon which annual interest is to be computed, but it also largely increases the amount of expenses to be deducted from annual revenues, and correspondingly reduces the net revenues available for the payment of interest upon investment "The combined net revenues accruing from the Canal and its business units," in 1939, as computed by the Canal authorities, "produced a return of 2 86 percent on net investment " Based upon the revenues and expenses as calculated in preparing Exhibit W-15, the "percent of return, in 1939, on present investment," less past amortization, in Canal transit property was 2 36, while for "business property" the "percent of return on depreciated investment" was 2 536

If the Canal enterprise as a whole is considered as a unit, and the entire net income is divided by the entire investment less depreciation (without taking account of amortization in connection with investment and expenses), the data contained in Exhibit W-15 show that the net revenues for the fiscal year 1939 would make available the payment of interest of 2 734 percent upon the amount of the investment at the beginning of the fiscal year If the amount of amortization, to 1939, of the non-depreciable Canal "transit" property be deducted from the investment in the Canal enterprise as a whole for the fiscal year 1939, and if the amount of amortization for the fiscal year, 1939, be included in expenses, the interest return upon the investment, for 1939, becomes 2 51 As the tables in Exhibit W-15, from which the data as to investment, earnings, and expenses were taken, are extensions of tables contained in the Report of the *Coordinator of Transportation* which brought the data to 1936, the methods and results of the investigation made by the staff of the Coordinator would show rates of return upon unamortized and amortized investment similar to those based upon the tables in Exhibit W-15

Because of the relatively small amount of annual property depreciation which the Canal authorities include in annual expenses, and because they have not included amortization in their financial accounts, the annual rate of interest on net investment, as stated in the annual reports of the Governor of the Canal, is higher than the rate as shown by the tables in the Report of the Coordinator of Transportation and in Exhibit W-15 of the Board of Investigation and Research The Governor's report for 1939 states that the annual net revenues from Canal operations and "business" operations were $14,522,343 67 If to this be added the net revenues derived from the properties operated by the Panama Railroad Company, the total for the Canal enterprise becomes $16,004,190 17, which would yield interest at the rate of 2 985 percent upon the net investment less depreciation, at the beginning of the fiscal year 1939, as shown in the reports of the Panama Canal Authorities and the Panama Railroad Company Thus before traffic and tolls were cut down by the present World War the net earnings of the Canal enterprise as a whole were nearly 3 percent of the investment, less accrued depreciation, as investment and expenses were reckoned by the Canal authorities This leaves amortization out of the calculation

As has been stated, if the net investment, less depreciation, at the beginning of the fiscal year 1939, be computed by the method followed by the Committee on Panama Canal Tolls and Vessel Measurement Rules, the net revenues of the Canal enterprise as a whole during the fiscal year 1939 amount to about 2 97 percent on investment This calculation also makes no provision for amortization of non-depreciable property

In computing the annual earnings of the Panama Canal, neither the Canal authorities nor the Committee on Tolls and Vessel Measurement Rules included the amount that would have been received had the war vessels of the United States Government and vessels of the Republic of Panama that were accorded free transit paid tolls that were levied upon other vessels. The Report of the Coordinator of Transportation and Exhibit W-15 of the Board of Investigation and Research state both the amount collected from tolls and the amount that would have been received had the vessels accorded free transit paid the regular tolls The data as presented in the Coordinator's report show that, for 1936, the rate of return on depreciated investment in the Canal "transit property" was 2 59 percent In computing this rate of return, the charges for annual depreciation and amortization are included in expenses, and the revenues are adjusted by adding to those actually received the amount of "tolls applicable to vessels given free transit" As calculated by the authors of the Coordinator's report, the total investment less amortization and depreciation, or depreciation reserves, in the Canal enterprise as a whole was $468,655,632.66; the net earnings from operation were $13,292,803.39, which would make the rate of return, or interest payable, upon investment 2 83 percent.

The data presented in Exhibit W-15 show that the total investment less depreciation and amortization in the Canal enterprise as a whole at the beginning of the fiscal year 1939 (July 1, 1938) was $442,792,034.76, and that the total net earnings derived from the three parts of the enterprise, including the amount that would have been received had tolls been paid by free-transit vessels, were $13,001,976 33—a return of 2.93 percent upon the net investment in the entire enterprise For the three years 1937-1939, the average rate of return upon the enterprise as a whole was 2 72 percent, as shown by the data in Exhibit W-15

The statement just made does not conflict with the one contained in Exhibit W-15 that "the average rate of return based upon the average investment in the Canal 'transit property,' not including 'business' property, and properties operated by the Panama Railroad Company over the period 1937-1941, was 2.179" This rate is based upon revenues that include tolls that would have been paid by free-transit vessels, but the only net revenues included are those derived from Canal transit and from civil administrative operations If the net revenues obtained from the operation of "business property" and the properties managed by the Panama Railroad Company had been included in net profits, and if total profits had been divided by total investment in the Canal enterprise as a whole, the rate of return for the five-year period would have been higher The percent of return on "Canal transit" property—revenues being adjusted to include tolls upon free-transit vessels—for the five years, 1937-1941, as stated in Exhibit W-15, was 2 179 Upon "business" property the rate of return for the five years was 3.387; and upon properties operated by the Panama Railroad Company the rate of return upon depreciated investment was 6 098 percent, and would have been 8 544 percent had those who were carried at reduced rates upon the Panama Steamship Line paid full fares

As above stated, the rate of return upon the net investment in the Canal enterprise as a whole, as investment, expenses, and revenues were calculated by the authors of Exhibit W-15, was 2 93 percent for 1939, and 2 72 for the three-year period 1937-1939 During the five-year period ending in 1941, there was a reduction in the traffic using the Canal and in the revenue from tolls, due to the World War, but the average annual rate of return for the five years on the average annual net investment, less depreciation, in the *entire* Canal enterprise was 3.2 percent, if the actual revenues are adjusted to include tolls on vessels accorded free transit and to include the extra amount that would have been received had all passengers on the Panama Steamship Line paid the regularly scheduled fares. The relatively large rise in the average rate of return for the five years, 1937–1941, as compared with the three-year period ending June 30, 1939, was due to the large increase, in 1940 and 1941, in the net income of the Panama Railroad, the Panama Steamship Line, and the "outside operations" of the Panama Railroad Company as a result of the services rendered for those connected with the construction of the third set of locks and for those concerned with the establishment, maintenance, and manning of large military defenses When the war ends, the income from these three sources will decline, but the Panama Railroad Company and its activities will doubtless be more profitable in the future than they were before the war

CONCLUSIONS

From the many, and doubtless confusing, facts and figures as to investment, earnings, expenses, and income of the several parts of the Panama Canal enterprise, and of the enterprise as a whole, the general conclusion may be drawn that in 1939, the last fiscal year before conditions were disrupted by the World War, the Panama Canal enterprise as a whole had become self-supporting, and that, if normal peace-time development had prevailed, provision might soon have been made for putting the enterprise upon a self-liquidating basis by the amortization, from earnings, of the non-depreciable property included in the investment

The data presented in the Report of the Coordinator of Transportation show that, for 1936, the investment in the Canal enterprise as a whole, less accrued depreciation of depreciable property and depreciation reserves, and less amortization to date, had net earnings equal to a rate of return of 2 83 percent, the amount of "tolls applicable to vessels given free transit" being included in earnings

According to the Exhibit prepared for the Board of Investigation and Research, the total net earnings of the entire Canal enterprise, during the fiscal year 1939, adjusted to include the amount of tolls that would have been received from vessels given free transit, yield a return of 2.93 percent upon net investment, the annual depreciation and amortization charges being included in expenses.

The Panama Canal Authorities in their accounts have not provided for amortization of non-depreciable property, and they have included in annual expenses a smaller amount than others have included for depreciation of the property connected with Canal transit and Canal Zone Administration The net investment, for 1939, in Canal transit property and in the Canal enterprise as a whole, as reckoned by the Canal authorities, is larger than the net investment as stated in the Coordinator's report and in the Exhibit of the Board of Investigation and Research Upon this larger net investment in the entire Canal enterprise, as calculated by the Canal authorities, the net income for 1939 yielded a return of 2 985 percent If there had been no World War, the net revenues of the enterprise, as calculated by the Canal authorities, would have been sufficient, following the fiscal year 1939, to have made possible the beginning of the amortization, from earnings, of the investment in non-depreciable property

Upon the net investment in the Canal enterprise as a whole, at the beginning of the fiscal year 1939, as determined by the method followed by the Committee on Tolls and Vessel Measurement Rules, the rate of return for that fiscal year was 2 98 percent, $3,500,000 for depreciation and replacements and betterments having been included in expenses deducted from revenues to determine the net income This calculation may adequately cover depreciation, by charges against revenues, but it does not provide for the amortization, from earnings, of non-depreciable property investment

It is evident that during the years intervening between the official date fixed for the end of the Canal construction, July 11, 1920, and the fiscal year 1939, there was a relatively large amount of accrued depreciation of property that had not been offset by annual charges against revenue A part of the total capital investment in the Canal enterprise had thus been lost However, before 1939, the net investment, less depreciation, in the Canal enterprise had come to be upon a self-supporting basis Before the outbreak of the World War, in 1939, plans were being made for the construction of a third set of locks alongside the original twin locks This addition to the facilities was needed to accommodate commercial and naval vessels that are too large to pass through locks a thousand feet in length and a hundred and ten feet in width There was no other apparent need for the early addition of a third set of locks, but the proposed expenditure was justifiable It meant a substantial addition to capital investment, but, by the time of the completion of the construction of the proposed locks—possibly in 1950—the increased traffic and revenues might have been sufficient to keep the Canal enterprise as a whole upon a self-supporting basis. Some increase in the present relatively low rate of tolls might have been found necessary

The present and probable future status of Panama Canal finances has been changed by the World War. Had the World War not occurred, the Canal enterprise as a whole could have been definitely continued on a self-supporting basis as a commercial facility, and in the not distant future provision could have been made for the amortization of investment from current earnings When the war is over, and the rate of increase in traffic and revenues again becomes normal, and when the work now in progress upon additional locks and channel approaches has been completed, a careful study should be made of the amount of the investment in the Canal as a commercial enterprise, and of the amount of the investment that has been made for military reasons That having been done, the tolls and other service charges should be so adjusted as to yield revenues that will enable the Canal and its associated activities to be self-supporting as a commercial enterprise The investment that has been made and the expenses that are incurred for military reasons should be a part of the national outlay for military defense Whether and when the future Canal revenues should be made such as to provide for the liquidation of the investment in the Canal as a commercial enterprise, is a question that should receive prompt consideration after the war in reaching decisions as to policy regarding the Canal

THE ECONOMICS OF TRANSITION

ALEXANDER LOVEDAY

Director, Economic and Financial and Transit Department of the League of Nations

(*Read February 19, 1943*)

I HAVE entitled my subject today "The Economics of Transition." By this I do not mean economics in transition, though in fact there is taking place, I believe, a profound change in the whole philosophy of economics. I mean the transition from the economy of war to the economy of peace.

Many people are reluctant to discuss this question and argue that we cannot foresee accurately enough what conditions will prevail at the end of the war nor what the public will want, or they urge that there is no time to think about peace during the war. So during the peace people were reluctant to think about the possibility of war and had no time, and that is one reason why we are at war today. If we do not prepare for peace, we shall lose it, the world will quite surely be at war again in our children's lifetime if not in our own. We have got to think in advance both about political security and about economic security. We must prepare for peace and, what is more, we must make and shape our own future.

That will be the easier on account of the one great advantage we can boast today over the situation a quarter of a century ago. We cannot look back. We cannot try to patch up the old order as it existed in 1939 because in 1939 there was none. There were only the ruins of an order. The world had disintegrated into a number of economic fragments, some already at war and some preparing for war. There was no world economic order and no universal desire to create one. There was no economic creed and no desire to find one. Trade was being used by the Axis Powers not as a channel of welfare, but as an instrument of power politics, currency controls were being used as a means by which the rich could extract credit from the poor.

We are forced, therefore, today to look forward and not backward—to think constructively and not regretfully—like Noah and not like Lot's wife.

We must think constructively and build brick by brick from the point at which the war ends. Can we, in fact, hope to build for the future more solidly than last time? Or will the whole structure begin to crumble again after a few years, as it did in 1929? I think that if we examine the causes of that crumbling and of the final collapse, we shall find grounds for optimism. The causes may have been manifold, but there are two or three which stand out clearly as having dominant importance. The first and most obvious is that no concerted policy for dealing with the difficult transition from war to peace was formulated prior to 1918. A great and a noble humanitarian effort to afford relief to the stricken peoples of Europe was made. But there was no concerted policy of adaptation to peace conditions or of reconstruction. Inevitably everything went wrong at the outset. For fear of unemployment, a price boom was allowed to develop and to burst, in the race to return to business as usual, all controls, national and international, were trampled under, in a world without policy or co-operation, in which wide areas were deprived of the bare necessities of life and of production, in which governments were uncertain at once of their tenure and their frontiers, financial control collapsed and currencies became wildly inflated, countries with more stable currencies, in dread of exchange dumping, imposed anti-inflation tariffs, the whole trading system was twisted out of shape at birth.

Now there is no need to repeat this history. With courage and foresight, we can prepare for the future, and my object today is to suggest certain broad lines of policy. In the light of past experience and in the determination to fight this war through to a finish—a finish which is after the end of hostilities—we can, I believe, if we will, effect a smooth transition from war to peace.

The second and more obvious cause of the breakdown of the economic system we tried to re-establish was that when the perhaps inevitable depression occurred in 1929, the governments did not know what to do. There was no generally accepted doctrine about the causes of depression, there was certainly no body of accepted rules for overcoming them. It was not even an accepted doctrine that governments should try to overcome them In the end, they were forced to take some action. They groped– each for itself Some were successful, the vast majority were not, and the action taken in the aggregate probably worsened the situation

The third cause was that certain governments did not wish to restore or construct any working international, economic system, but seized the occasion that the collapse afforded to promote their power to dominate and to conquer

These second and third causes, therefore, were lack of knowledge and lack of will Lack of will there may always be, there will always be men ready to seize the occasion offered by disaster to promote their own aggrandizement But if we can prevent another major depression after this war, we can prevent at least such an opportunity for power politics from arising It remains to be proved whether we can, but it is at least certain that we know incomparably more about the causes of depression and the means by which they can be checked and overcome than we did twelve years ago That leaves me mildly optimistic, and no person who has had over twenty years of international life could ever be more than mildly optimistic

We know better how to control our own destinies, but what sort of destiny do we want? Before we can frame policies for the transition from war to peace, we must have some ultimate objective of policy Public opinion will determine these objectives and is, I believe, doing so already A trend of opinion is emerging from the stress and welter of the depression of the thirties and of the war, showing a vigor and simplicity that augur well for the future As I understand it, some such view as the following is becoming more and more widely accepted

The war has shown that with modern mechanical equipment and present-day skills production can be enormously increased, and that with adequate organization all can be employed. We want to see an organization of society after the war in which this whole apparatus of production is kept actively engaged in producing what is required to satisfy human needs We want to begin with the consumer and make sure that the essential needs of all people are satisfied first in so far as our present equipment will permit. We want to assure that no person is left in want because his or her earning power is interrupted or reduced by old age or sickness, we want to assure, moreover, that no person willing to work and capable of working shall be prevented from doing so We want to maintain the liberty of the individual to choose his own occupation, to work or to rest, to save or to spend, to believe and to utter his beliefs We want the advantage of education to be available to all, and the advantages of modern means of production, of knowledge, and of trade to be available to all nations so that all may share in a rising standard of living

That, it seems to me, is the essence of what is being demanded, sometimes dramatically, sometimes inarticulately, but always with the same insistence on the essential points Think of the consumer first, think of all consumers, make sure that real needs are satisfied first; the skills and the mechanism and the raw materials are there, it can be done up to a certain level and it must be done and the level must be gradually raised, if simultaneous large-scale unemployment, large stocks of unsalable goods, and starvation were inevitable in society as it was organized, then the organization of society must be changed, but it must not be so changed as to sacrifice the liberty of the individual

That is a challenging creed, all the more challenging because it is so simple and sweeps aside difficulties Can the objectives be attained, can they be attained without sacrificing individual liberty or individual enterprise?

We ought to be under no illusion about the difficulty of assuring employment to all who are willing to work The analogy of war conditions may well be misleading With millions of men drawn off into the armed forces and almost unlimited orders for war requirements, it is far easier to guarantee employment than in peacetime, when demand depends on the changing and uncertain tastes of the individual In war the government compels saving in order to allow of its consumption and investment, in peace, saving may exceed individual consumption and investment and, if it does, demand slackens

But in spite of this, the very objectives of the creed we are discussing facilitate their own achievement This may seem paradoxical, but it is true Depressions sink deeper and deeper by a spiral process, because one man is unemployed he contracts his purchases and puts another out of employment, and the second a third, till the bottom falls out of demand Stop that, it is said, and you will convert your depressions into minor recessions in activity.

Depressions are largely caused because more is saved than is spent Establish an immutable demand for necessities, it is said, and you greatly reduce this risk, and year in year out you increase the chance for profitable business and individual enterprise That is true Whether success will actually be achieved will depend on the willingness of society to live up to its creed and the willingness of governments to take action when that is necessary It will not be achieved if business becomes nervous whenever the government has to stimulate a waning demand for goods or labor Nor will it be achieved if some workers try to keep others from occupations which offer opportunity, or if only the right but not the duty to work is claimed The obverse of every right is a responsibility

But more important than all these considerations is the fact that wars inevitably create forces that lead to instability The great wars of the past have been followed more or less immediately by deep depressions and wide-spread distress resulting from those depressions They twist and distort the economic structure, lead to an excess of certain forms of plant and skill and a scarcity of others, they sever the links of trade, they undermine habit and confidence, and they leave whole areas devastated and whole peoples incapable of purchasing what is necessary to re-start business

If the economic system starts rocking violently in the first years of peace, it may prove impossible to steady it, and governments afraid of the clamor for employment or of the insistent demand for security in an insecure world, may try to shut out the world, may resort again to autarchy, may abandon hope of liberty and compel the individual to work where they will, for what wages they will, and for such hours as they will Democracy will have lost the peace

The problem of effecting a smooth transition from war to peace is, therefore, of vital importance Our whole future may depend upon it Can we effect it? I believe we can if we think out in advance the problems that are likely to arise and frame policies in advance for the solution of those problems I propose to select three such problems by way of illustration and I shall endeavor to show that, for the solution of all these problems, it will be necessary not only to elaborate policies in advance, but to elaborate concerted international policies

We must have a picture in our minds of the conditions that are likely to present themselves Those conditions will, of course, vary vastly from country to country and from region to region. But the richer countries will have a dominant influence in creating or preventing a post-war boom or depression, and on them will rest the major responsibility for avoiding post-war chaos in the poorer countries

Let us examine first, then, the probable picture in these richer countries We shall find on the one hand an enormous pent-up demand for all the goods which could not be obtained during the war, on the other, men ready to be demobilized to make them and savings that have accumulated because of wartime restrictions on buying People will want to convert these savings into cash, and there will be a rush for goods unless measures are taken to check it On the top of the demand in these countries, there will be the needs of the occupied and devastated areas—urgent needs for food and clothing, for harbor equipment and rolling stock, for rehousing and reconstruction If starvation or semi-starvation is to be avoided, the immediate post-war demand for first necessities will be much greater than it is today

The first danger we have to face, therefore, is a boom in prices, especially the prices of prime necessities, followed by a slump This is exactly what happened after the last armistice Men were reabsorbed into industry with extraordinary rapidity—only to be thrown out on the streets again a year and a half later There is no excuse for that sort of development which will, of course, render it much more difficult for the poorer countries to get what they require Before considering how to avoid it, however, let me pass on to the second cause of instability

The second cause I have in mind is the almost inevitably bumpy nature of the post-war demand for durable goods, for houses, motor cars, household furnishings, in poorer countries, bicycles, etc The demand will be bumpy for this reason The stock of these goods in the hands of the consumer will be largely worn out or out of date Everyone will want to replace what he has as quickly as he can afford to do so There will be a sudden, forceful, wide-spread demand, and when that is satisfied, there will be an abnormal proportion of new, durable goods which will last for some time and will not have to be replaced immediately, demand will slump What has really happened is that the age distribution of the goods in the hands of the public is an abnormal one owing to the war, and it will take a considerable number of years before it gets smoothed out But until it is smoothed out, the demand will be bumpy, we may expect that demand will come forward in waves, beginning with a heavy swell and trough and gradually over the years diminishing to a ripple Thus the abstention from buying durable goods today will render immediate recovery much easier, but will render a smooth transition from war to peace more difficult

The third danger I want to mention is the danger of inflation—serious runaway inflation, if we fail to provide the countries which have not got enough foreign assets with the food and raw materials necessary to get economic activity restarted In China there is already such serious inflation that some taxes are being paid in kind, in rice, in Europe, owing to the German occupation charges, the whole scene is set for inflation At present control is being exercised with varying degrees of success But if the war is followed by a weakening of central authority, or if, when the time comes, countries have to obtain raw materials at any sacrifice in order to get their men employed, and their citizens start directly or indirectly selling their currency on a large scale to do this, then we shall be faced again by a repetition of the social tragedies of the early twenties And social tragedies may lead to social upheavals and a situation in which the objectives of policy we are discussing are as inaccessible and uncertain as the Milky Way.

I have deliberately chosen three very different types of problems the last clearly international, but most likely to arise in the poorer or more stricken lands, the second—the bumpy nature of the demand for durable goods—apparently domestic and of major importance in the richer countries only, the first—the risk of a price boom—universal Is this first a national or international issue? I submit that the answer to that question is that they are all essentially international questions, as is the whole problem of a smooth transition.

Let us examine the first question—the danger of a price boom A single country can try to check prices by control of credit, by continuing rationing, by price ceilings But if others are competing in the world markets and are forcing up the prices of the goods it must have, it will be compelled to follow the market and raise its ceilings. The only possible means of avoiding this danger in the period of post-war scarcity is to continue the government purchase of crude products and the international control of tonnage and to co-ordinate domestic rationing, so long as serious scarcity exists.

If one country suddenly abolishes its rationing, it will deprive others of a part of the world's scant supply of goods, and by competing for these goods, force up prices What is required is a general and gradual increase of rations in all countries as supplies become more abundant. By this I do not, of course, mean that rations in all countries should be equal or even that they should be increased in all countries by proportionate amounts. Conditions vary far too widely from area to area for any such automatic rule But they should be raised by common assent and not by unilateral action The need for joint action and for many of the war controls is determined not simply by the existence of hostilities, but by the existence of scarcities, and this fact requires to be understood and accepted in advance

Logically it is natural to move from a consideration of the demand for consumers' nondurable goods—roughly the rationed articles—to consumers' durable goods, as I have done above But the whole picture falls more readily into perspective if we think rather chronologically than logically Chronologically the next problem after purchase is the distribution of food and raw materials, which involves the whole problem of relief and reconstruction This is patently an international issue and one of quite vital importance

I link the words "relief" and "reconstruction" together deliberately because here there is really only one problem—how to get production going again in countries where human beings are starving for lack of food, and machines are idle for lack of raw materials. There is a danger in regarding this mainly as a humanitarian question. In some countries the most urgent need will be for food, in some for raw materials Some will have the means with which to pay, and some will not. Whatever the needs, if the lack of means of payment threatens a breakdown, economic disorder, and social chaos, then there is a case for rendering assistance There is a case for rendering assistance not simply on grounds of humanity, of relieving physical distress, but because we can only win the war if we win the peace, create order out of disorder, and avert chaos. To provide food alone will not avert chaos, nor indeed is it common sense or good business. Men want to be able to produce themselves, to be active and independent and not to batten on others. The cost, whatever it may be, of effecting a smooth transition must be less than the cost of trying to restore order out of post-war chaos I have used the expression "rendering assistance" rather than "giving relief" deliberately, because the capacity of the stricken areas to pay immediately or later cannot be foreseen at this date. The points I want to make are that whatever the financial arrangements—and we may hope that they will be based on the accepted principle of equality of sacrifice—relief and reconstruction are a unique problem—an international problem and one which can be solved only if policy is determined in advance Let us assume then that some such policy as I have suggested is adopted and adopted in time, and there is, I think, no good reason at present for assuming that it will not be, what chance is there then of maintaining a stable economic system in the world and reaching out with some measure of success to the objectives of economic policy that seem to be so widely accepted today?

Amongst many others there remains our second danger, the bumpy nature of the post-war demand for durable goods. Now one of the major causes of depressions is that the demand for durable goods always tends to be bumpy The difficulty I have mentioned about the age distribution of these goods after the war will accentuate this major factor of instability and in a sense does not present a new problem Keep the demand for capital goods stable, many economists say, and you will keep the whole economy stable They may well be right, in any case it is certain that if depressions and unemployment are to be avoided, demand as a whole must be kept stable, and if governments accept the responsibility for preventing unemployment, they must accept responsibility for doing this But, if one government attempts this, acting alone, it will find its prices out of gear with the rest of the world, its exports drying up, its currency reserves depleted, and it will be driven to abandon its policy, to allow its exchanges to depreciate, or to resort to autarchy It can no more do this alone than a member bank can get out of step with the general credit policy of the Federal Reserve System Failure to realize this fact accentuated the depression of the thirties and led to the autarchy of the thirties and the war of the forties Have we learnt our lesson? I do not know But I am quite sure that if we have not, fate—a harsh teacher—will make us go through it again

We have been in the habit of thinking of currency and trade as the two essentially international departments of economic policy That is, I think, a mistaken view International cooperation is required above all in the formulation and execution of anti-depression policies—policies for maintaining full employment The real choice that lies before us in the future is the choice between such joint policies and autarchy. If we choose in favor of autarchy, we shall quite certainly sacrifice individual liberty

THE PROBLEM OF SELF-DETERMINISM

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(Read February 20, 1943)

IN A remarkable lecture on "The World Economic Crisis," delivered at the Polish Institute of Arts and Sciences in America, Professor Ernest Minor Patterson, enumerating the various crises of our times, mentioned also the crisis of self-determinism.[1] He rightly pointed out that the outbreak of another world war has given emphasis to this crisis so that at present the very principle of self-determinism seems to be questioned.

In order to understand the deeper reasons of such a critical approach to the problem, it is worth while reviewing, even in an oversimplified form, the usual argumentation of those who want to "reconsider" the right to national self-determination.[2] They recall that the peace after the first world war was supposed to be based upon the idea of self-determinism; they stress the failure of that settlement, as evidenced by the present war, and they conclude, with much apparent logic, that consequently the basic principle must have been wrong.

Their approach is obviously a historical one, and therefore a discussion from the historical point of view is badly needed, especially as usually the principle of self-determinism is defended from the viewpoint of international law.[3] For a historian, it is easy to notice a first mistake of the deductions which have been summarized above. As in so many other cases, the historical background of contemporary international relations ought not to be limited to contemporary history, to the well-known events of the last years. Discussing the problem of national consciousness which is so closely connected with that of self-determinism, Professor Halvdan Koht, in contradistinction to those who begin the study of nationalism with the French Revolution, goes back to the early Middle Ages.[4] And the idea of self-determinism can be traced back even farther: it is as old as history itself.

There is a famous passage in Thucydides, who in order to show the importance of the Peloponnesian war, which he so admirably described, emphasizes that it was fought "for the greatest things: freedom and rule of others." Opposing those two ideas, the great Greek historian suggests an excellent definition of self-determinism: it simply is the principle of freedom from foreign rule. It is that basic freedom, the prerequisite condition of the four others, which a great contemporary American writer has called "the freedom to be free."

Similar examples could easily be found in the whole course of ancient history, particularly in all cases of resistance against the conquest by any of the great Empires. When the last of these Empires of Antiquity, the Roman one, was "transferred" to the Germans and became the medieval Roman Empire of the German nation, the resistance of almost all the other European countries against its claims of supremacy was already much more akin to what we now call self-determinism. Essentially different from the struggle for hegemony between the city-states of ancient Greece, it already was a movement closely associated with the growth of national consciousness among the non-German peoples—in many cases the same nations which were to claim the right of self-determination in 1918 and are fighting today for freedom from foreign rule.

As early as the first half of the fifteenth century some typical cases can be quoted where the fight against foreign rule clearly appears as inspired by the idea of national self-determinism. In Western Europe it was the Hundred Years War which, having started in the fourteenth century as one of the many dynastic conflicts of the Middle Ages, became in its second phase, in the days of Joan of Arc, a war of liberation of the French nation. In eastern Central Europe, the Poles and the Lithuanians, defending themselves against the Teutonic Order, were so fully aware of the nature of their struggle, that they submitted to the Council of Constance a scholarly treatise where the right of self-determination of all nations, including even the pagans, was proclaimed in an almost modern spirit.[5] At the same time, the Hussite wars were not only fought for religious and social reasons, but also, perhaps even chiefly, for the national freedom of the Czechs. Likewise, when the Protestants of the Low Countries rebelled against Catholic Spain, or when the Irish Catholics defended their faith against Cromwell's Puritans, these religious wars of the sixteenth and seventeenth century were also struggles for national rights.

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[1] *Bulletin of the Polish Institute*, 1 (2). 262, January, 1943.

[2] This paper was already read when I received Professor Erich Hula's pamphlet, "National self-determination reconsidered" (*Studies on War and Peace* 24, published by the New School for Social Research, New York). I hope to reply on another occasion to his new arguments.

[3] See two recent articles by Józef Sulkowski, "The principle-of self-determination" and "The Atlantic Charter and the principle of self-determination" (*New Europe*, 2 (8), July, 1942, and (9), August, 1942).

[4] See the brief summary of Professor Koht's views in *Bulletin of the Polish Institute*, 1 (2) 287.

In general, the greatest events of all ages which still appeal to us and seem so much nearer than intricated diplomatic problems of the same times, are, as a matter of fact, expressions of self-determinism which would occupy an outstanding place in any history of freedom, as planned once by Lord Acton. At least one more example must be mentioned, not only because of the very place of this meeting, but also because it opens a new period in the history of self-determinism: the American War of Independence certainly was a decisive triumph of that principle, a first step towards its universal recognition in theory, and the inauguration of a century where the practical realization of the right to national self-determination was steadily progressing in both hemispheres.

This progress can be explained by the intimate connection of self-determinism with another principle which was in progress since the end of the eighteenth century: with democracy. Democracy too was by no means something new. Its earliest definition can also be found in Thucydides: in the famous speech made by Pericles at the funerals of the first victims of the Peloponnesian war. The medieval tradition of self-determinism was sometimes, as in the case of Switzerland, first an expression of democracy, without national aspirations, merely directed against the oppression of free communities by feudal overlords, but just this case is particularly instructive, because it shows how soon such a process resulted in the formation of a new nationality, deeply attached to its independence. The main dates in the further development of European democracy, 1789 and 1848, strongly confirm the thesis of the close relationship between the two principles: the French Revolution interpreted the Rights of Man and Citizen as including the right of any nation to freedom and independence, and the year which saw the fall of Metternich and of his system is well known as "the spring of the nations."

Without discussing these familiar questions,[6] it can be said that without democracy national self-determination has proved difficult to achieve, while true democracy simply is impossible without national self-determination. A government of the people, for the people, and by the people cannot be realized, as long as one people is governed by another. And these considerations suggest a second definition of self-determinism, complementary to the expression of Thucydides: in the light of modern experience we also may say that self-determinism is democracy in international relations.

Nobody was more aware of this connection than President Wilson. He knew that the world could not be made safe for democracy without putting the right of national self-determination fully in practice. He did not, however, consider it the only basis of the peace conditions which he suggested. Almost half of his famous fourteen points (1-5 and 14) deal with general problems of international organization. Such an organization was for him the indispensable corollary of self-determinism. And here we come to the second mistake which is being made by the adversaries of this principle. The final settlement after the first world war proved deficient not because self-determinism was its main foundation, or rather one of its main foundations, but only because the second foundation, as materialized in the League of Nations, was not sufficiently strong.

Both of these foundations were conceived out of the highest moral motives. In the case of Alsace-Lorraine, it was clearly said in the treaty itself that it was restored to France in order to repair the wrong which had been done in 1871 by disregarding the desires of the population concerned. For similar reasons the plebiscite in Schleswig, which had not been held in 1864, was organized after the victory of the Allies although they had no direct interest in the matter The liberation of Poland and of Czechoslovakia was a reparation for much greater injustices of the past Discussing the second of these cases, Professor J T Shotwell has remarked with good reason that it was not a question of artificially creating a new state, but whether or not the national independence movement which already had succeeded in liberating the country, should be officially recognized or repressed by the peacemakers [7] In the case of Poland the situation was exactly the same

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[5] "Tractatus de potestate Papae et Imperatoris respectu Infidelium," written in 1416 by Paulus Vladimiri (Pawel Wlodkowic), Rector of the University of Cracow; the Latin original has been edited by M. Bobrzyński in *Starodawne Prawa Polskiego Pomniki* (Monuments of Old Polish Law), published by the Polish Academy.

[6] An extremely rich material on the whole movement towards national self-determination through the nineteenth century can be found in Professor G. Weill's book, *L'Europe du dix-neuvième siècle et l'idée de nationalité*, Paris, 1938 (in the collection *L'Évolution de l'humanité*, edited by H. Berr).

It therefore must be added that such moral considerations, far from being artificially introduced into the treaties by some abstract idealism, were supported by, and in agreement with, the concrete situation in Europe as it emerged out of the first world war And how strong the trend towards self-determination then was on the whole continent, is best illustrated by the example of the Baltic countries They achieved independence although they received no support at the Paris Conference, were not even mentioned in the peace treaties there prepared, and were recognized by the great powers only in 1921, after having been refused admittance at the first Assembly of the League.

It is hardly necessary to point out that the practical application of self-determinism was not without serious difficulties, especially as far as the drafting of the new frontiers was concerned But instead of discussing in detail the minor mistakes of the peace-makers, it might be interesting to observe that those who wanted to correct them, made the situation even worse. The Hungarian-Rumanian frontier, as fixed in the treaty of Trianon, which is particularly easy to criticize, was, however, much less shocking than the partition of the disputed territory of Transylvania twenty years later, in the middle of the second world war

If we mention this point, it is chiefly because it is one of the many proofs that the outbreak of that war had nothing to do with the unavoidable shortcomings of the application of self-determinism Such alleged shortcomings only served as pretexts for the territorial "revisions" of the peace treaties which directly led to another war. The first pretext, in the case of Austria, is particularly instructive It is true that under the treaties of Versailles and Saint-Germain, Austria was not allowed to join Germany. But there was no real violation of self-determinism, because the Austrians were not placed under foreign rule, but freely governed themselves, and even those of them who desired some kind of federal union with Germany, did not wish the complete absorption of their country whose very name was suppressed in 1938 In the case of the Sudeten, the claim of granting self-determination to three millions of Germans, i. e to less than one twentieth of the German people, had to serve as a pretext for eventually depriving of that same right the whole Czech nation, i e almost three times more people The claims directed against Poland in 1939, again nothing but a pretext for destroying the whole country, were in addition an obvious distortion of the idea of self-determinism Danzig, like Austria, was not at all placed under foreign rule by the treaty of Versailles which made it a free city, and better communications for the Germans of East Prussia had much less to do with self-determination than the freedom of the Polish population living between Germany and her East Prussian colony

A biased and one-sided interpretation of the peace treaties, both of their foundations and of the details of execution, is, however, only one more historical mistake of the adversaries of self-determinism. Much more serious, because connected with the future, is their advice that other principles should replace it at the next peace conference.

It is hardly believable that one of the solutions, advocated by many of those who consider it reactionary to look back to 1919, is the return to the methods of 1815. The Congress of Vienna and its decisions used to be considered a symbol of darkest reaction. It would be unfair to enter into lengthy polemics with a great historian who recently died shortly after having described the "reconstruction of Europe," achieved in 1815, as a model of post-war reconstruction to be imitated by our generation [8] It is very improbable, indeed, that the principle of legitimism would have a stronger appeal after the present war than the principle of self-determinism But it ought to be stressed that even that principle was not at all respected by the Congress of Vienna which used it as a pretext, but refused to restore either Poland, dismembered after eight centuries of legitimate existence, or the equally old Republic of Venice. And the long series of revolutions and wars which started a few years after 1815, to reach a climax in the period of 1848 to 1878, refutes the widespread belief that the Congress of Vienna succeeded in securing to Europe a century of almost undisturbed peace.

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[7] *Czechoslovakia—Twenty years of independence*, edited by R. J Kerner, University of California Press, 1940. Professor Shotwell asked there (p. 444): "Can anyone imagine what the American people would have said, if after having secured the condition of freedom for these peoples through a costly war, we then had turned against them and repressed their liberties in the interests of the sovereign whose authority they had renounced?"

[8] Guglielmo Ferrero, *The reconstruction of Europe; Talleyrand and the Congress of Vienna 1814–1815* (transl.). New York, 1940.

There is another, much more important school of thought, which, criticizing the last peace treaties for having subordinated economics to politics, now wishes to replace the principle of national self-determinism by what we may call economic determinism. Instead of discussing the philosophical issues involved, it ought to be realized that all the truly important economic requirements can receive full satisfaction without abandoning national self-determination, without suppressing any political units and even without changing boundaries. It is simply a question of readjusting the economic policy of the existing states by avoiding economic nationalism and by giving up the misleading idea of economic autarchy. This idea is not at all exclusively inherent in the so-called smaller states, and certainly is much more dangerous, when applied by larger political units.

As a matter of fact, the economic arguments directed against national self-determinism are only part of a third ideological system, whose hostility to self-determination is particularly violent. It is another determinism, this time a geographical one, which pretends to be based on a new science, named geopolitics. This alleged science is nothing but a distortion and abuse of geography for political purposes. Frequently connected with racial determinism, or even prejudice, it is, like this racial superstition, a systematic German adaptation of extravagant ideas imported from other countries. Geopolitics had first been propagated by a Swedish geographer, R. Kjellén, but it remained almost unknown in Sweden. In Germany it has been associated with the deterministic ideas of F. Ratzel's school of anthropogeography and now is nothing but a tool of propaganda and power-politics. An amazing article published a year ago in an American magazine has shown that practically everything can be "proved" by arbitrarily applying geopolitical slogans. On the contrary, the really scientific school of "human geography," founded in France by Vidal de la Blache and developed by Jean Brunhes, Lucien Febvre, and others, has made it clear that geography, important as it is for the study of international relations, can only suggest possibilities of solutions which ought to be determined by the free decisions of the peoples concerned.

National self-determinism, which is the expression of this free will of living or not living together, is certainly not infallible. Dangerous clashes between the self-determination of different groups, especially in frontier regions and even more in territories with mixed populations, may lead to erroneous solutions and sometimes seem impossible to conciliate. There are, however, ways and means of readjustment and compromise. One naturally first thinks of plebiscites. Their technique has been greatly developed in modern times, as described in Miss Wambaugh's well-known books,[9] based on practical experiences made after the last peace conference. The same experience is, however, a serious warning that an unscrupulous and often terroristic propaganda can easily falsify such an expression of the people's desire. It is particularly dangerous to postpone too long the organization of any plebiscite. In the case of Upper Silesia, for instance, the period of almost two years between the signing of the treaty and the actual vote, which was expected to be a "cooling-off" period, actually became a period of disastrous excitement, as predicted by I. J. Paderewski at the Paris Conference.[10] In the present situation, after ruthless deportations of millions of people, plebiscites in such regions would prove entirely misleading.

Another method should therefore be recommended. Its name, very familiar in this country, is federalism. Its close connection with both democracy and self-determination is also illustrated by the Swiss example. In spite of the increasing interest in federalism, its history, like the history of freedom, has never been written. A first attempt, made by E. A. Freeman[11] in the year which he absurdly believed to be the year of "the disruption of the United States," was not very encouraging. Among many other mistakes, he made the error of not distinguishing between various forms of federalism. All these forms: local federalism, national federalism, and international federalism, whether regional or global, offer almost unlimited possibilities of making national self-determination work and succeed.

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[9] Sarah Wambaugh, *A monograph on plebiscites*, New York, 1920, and *Plebiscites since the World War*, Washington, 1933.

[10] At the session of June 14, expressing his regret that a plebiscite had been decided, Paderewski added: "As to the period of waiting which you have provided, it will create an unwelcome tension. The plebiscite should not be put off longer than six months at the most." See Charles Phillips, *Paderewski*, p. 408, New York, 1933.

[11] Edward Augustus Freeman, *History of federal government from the foundation of the Achaian League to the disruption of the United States*, 1, London-Cambridge, 1863; second enlarged edition *History of federal govern-*

Local federalism, usually called autonomy, can give satisfaction to the claims of smaller groups or of fractions of nationalities, without disorganizing the state to which they belong, by inconsiderate changes of frontiers. Instead of separating the Sudeten territory from Czechoslovakia, contrary to both history and economics, without even mentioning security, the problem can be settled by local autonomy, excluding, of course, any national-socialist organization. Within the pre-war frontier of Poland in the East, which already was a frontier of compromise and could not be pushed back without questioning the very existence of the country and her economic and cultural development, compact groups of the Ukrainian minority could be satisfied by a similar local autonomy.

In cases where the minor groups concerned are forming an ethnic and cultural whole, a federal constitution of the entire state would be highly advisable. In Czechoslovakia and Yugoslavia, for instance, two states whose complete restitution is an indispensable condition of a just peace, a federal form of national government would give satisfaction to the Slovaks, or to the Croats and Slovenes. National federalism also seems to be the only solution of the German problem, in a country where centralization proved particularly disastrous.

In all similar cases the experience of Switzerland and of the United States of America can be extremely helpful. The situation is rather different when it is a question of federating nations which before had been entirely independent units. In European history the Polish-Lithuanian Union was one of the most successful experiments in that direction,[12] while the Kalmar Union of the Scandinavian Kingdoms, started simultaneously under more favorable conditions, ended in a failure. Such federal unions can never be enforced and always must be based on the principle of full equality, as well as on real common interests. Their organization ought to begin in limited regions where the co-operation of two or more states of small or medium size seems a necessary complement of their self-determination, as for instance, in the eastern part of Central Europe.

Hoping soon to discuss that problem on another occasion, we should like to end by emphasizing that a universal federal system, stronger than the League of Nations had been, would be, as in 1919, the highly desirable counterpart of national self-determinism. A return to both of these principles, with a view to co-ordinating them harmoniously, would guarantee a durable peace much better than any other method. Legal equality of all members, great and small, of the world federation would be a condition as indispensable as in the case of regional federations. These regional groups would make it so much easier to apply this principle of equality, because, as suggested in Mr Churchill's important speech of March 21, the striking difference between the smallest national units and the biggest states would thus lose much of its significance. Nevertheless, it is highly probable that the great powers will have exceptional responsibilities in the period immediately following the present war, and in special areas. The least, however, which can be asked in the name of self-determination, is the right for any nation, even the smallest one, freely to choose the "area of responsibility" to which it should belong. Only then the practical necessities of a world in crisis will be reconciled with the three fundamental and inseparable principles of federalism, democracy and self-determinism.

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ment in Greece and Italy, ed. by J. B Bury, London–New York, 1883

[12] I have described the first two centuries of its development in my book, *Dzieje Unii Jagiellońskiej* (2 vol , Cracow, 1919–1920), and I have also compared it with the Kalmar Union in a lecture delivered at the University of Upsala in November, 1937, published (in Polish) in a collection of studies in honor of Professor Stanisław Kutrzeba (Cracow, 1938)

THOMAS JEFFERSON

Papers read before
The American Philosophical Society
in celebration of the
BICENTENNIAL OF THOMAS JEFFERSON
Third President of the Society

Annual Meeting
April 22, 23, and 24, 1943

PHILADELPHIA
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CONTENTS

Introduction to the Jefferson Bicentennial Program 199
Edwin G Conklin, President, American Philosophical Society

What Is Still Living in the Political Philosophy of Thomas Jefferson? 201
Carl Becker, Cornell University

Jefferson as a Lawyer 211
Roland S Morris, President of the American Philosophical Society, 1932–1942

Thomas Jefferson—Farmer 216
M L Wilson, United States Department of Agriculture

Thomas Jefferson and the Classics 223
Louis B Wright, Henry E Huntington Library and Art Gallery

Notes on Thomas Jefferson as a Natural Philosopher 234
Harlow Shapley, Harvard College Observatory

Jefferson and the Arts 238
Fiske Kimball, Philadelphia Museum of Art

The Old Political Philosophy and the New 246
John Dickinson, General Counsel of the Pennsylvania Railroad Company and Professor of Law, University of Pennsylvania

Jefferson and the American Philosophical Society 263
Gilbert Chinard, Princeton University

The Beginnings of the American Philosophical Society 277
Carl Van Doren

PLATE I

THOMAS JEFFERSON

President of the Society, 1797-1815

Painted by Thomas Sully

Presented by William Short, 1830

INTRODUCTION TO THE JEFFERSON BICENTENNIAL PROGRAM

EDWIN G CONKLIN

President, American Philosophical Society

(Read April 22, 1943)

THIS meeting is one of unusual interest because it marks the bicentenary of the founding of the American Philosophical Society by Benjamin Franklin and also the two-hundredth anniversary of the birth of Thomas Jefferson, third president of the Society The first day of the meeting and part of the second will be devoted to the scientific, scholarly, and artistic activities of Jefferson, while the founding of the Society in 1743 will be celebrated at the dinner at the close of the third day

If the Society had not celebrated in 1927 the two-hundredth anniversary of the beginning of Franklin's JUNTO, a precursor of the Society, as the bicentenary of the American Philosophical Society, greater prominence would have been given to this real bicentennial of the Society For one hundred and seventy years the accepted date of the founding of the Society was 1743 Its centennial was celebrated in 1843, its sesquicentennial in 1893 and its bicentennial was due in 1943 But on May 1, 1914, the Society voted to accept the report of a committee, recommending that the date of the starting of the JUNTO, 1727, be accepted as the date of the founding of the American Philosophical Society By this vote sixteen years were added to the age of the oldest learned society in America, which was already older by thirty-seven years than any other similar society in this country Since our two-hundredth anniversary was celebrated only sixteen years ago, it could not be made the chief event of this meeting, therefore the actual bicentennial of the Society was given a minor place on the program and the Jefferson celebration the chief place

Persons who do not realize what an important place Jefferson held in the American Philosophical Society may wonder why this Society should follow the University of Virginia and the Government of the United States in celebrating his birth The program of this meeting gives a satisfactory answer to any such query Thomas Jefferson was elected a member of the Society in 1780, Councillor 1781–1785, Vice President 1791-1794, President 1797–1815, Councillor 1818-1826 He contributed papers to the meetings and TRANSACTIONS, fossils and other natural history objects to the Cabinet, and books to the Library, consulted the Society and co-operated with some of its members in the Michaux and the Lewis and Clark explorations of the West

His letter to the secretaries of the Society accepting his election to the Presidency (as printed in the TRANSACTIONS 4 xii–xiii, 1799) reads

Monticello, Jan 28, 1797

GENTLEMEN,

I have duly received your favor of the 7th inst informing me that the American Philosophical Society have been pleased to name me their President The suffrage of a body, which comprehends whatever the American world has of distinction in philosophy and science in general, is the most flattering incident of my life, and that to which I am the most sensible My satisfaction would be complete, were it not for the consciousness that it is far beyond my titles. I feel no qualification for this distinguished post, but a sincere zeal for all the objects of our institution, and an ardent desire to see knowledge so disseminated through the mass of mankind, that it may at length reach even the extremes of society, beggars and kings I pray you, gentlemen, to testify for me to our body, my sense of their favor, and my dispositions to supply by zeal what I may be deficient in the other qualifications proper for their service, and to be assured that your testimony cannot go beyond my feelings.

Permit me to avail myself of this opportunity of expressing the sincere grief I feel for the loss of our beloved Rittenhouse Genius, science, modesty, purity of morals, simplicity of manners, marked him as one of nature's best samples of the perfection she can cover under the human form Surely no society, till ours, within the same compass of time, ever had to deplore the loss of two such members as Franklin and Rittenhouse Franklin, our Patriarch, the ornament of our age and country, whom Philosophy and Philanthropy announced the first of men, and whose name will be as a star of the first magnitude in the firmament of heaven, when the memory of his companions of the way will be lost in the abyss of time and space With the most affectionate attachment to their memory, and with sentiments of the highest respect to the Society, and to yourselves personally, I have the honor to be, Gentlemen

Your most obedient,
And most humble Servant,
TH JEFFERSON

Jefferson was at that time Vice President elect of the United States, he had been Secretary of State in President Washington's Cabinet, Minister to France succeeding Franklin, Governor of Virginia, author of the famous Statute of Virginia for Religious Freedom, author of the Declaration of Independence—and yet his respect for and devotion to science and learning were so great that he could say that election to the presidency of the American Philosophical Society was "the most flattering incident of my life, and that to which I am the most sensible."

For eighteen years he continued to be chosen President, although often suggesting that he be not further so honored Finally in 1815 the Society yielded to his urgent request and chose as his successor in that office Caspar Wistar Later for eight years he served as Councillor It is a splendid tribute to the superlative qualities of Jefferson, as it is also to the good sense and philosophic temper of the Society, that during that long period of more than forty years he continued to be chosen an officer of the Society, although he was the object of such hatred and denunciation by narrow-minded partisans, sectarians, and ecclesiastics as was rarely if ever visited upon any other public man in our history. These are some of the reasons why the American Philosophical Society has a special interest in, and affection for, Thomas Jefferson, and why the Society joins the Nation in celebrating the bicentennial of his birth

All of the addresses will be published in the Jefferson Bicentennial number of the PROCEEDINGS [1] In addition the Society is publishing in its series of MEMOIRS a volume on *Thomas Jefferson's Garden Book*, the original manuscript of which is in the possession of the Massachusetts Historical Society

During the meeting there will be an exhibition in the Members' Room of some of the fossils and other natural history objects presented to the Society by Jefferson, many of his letters, manuscripts, pamphlets, and books, including one of the very first drafts of the Declaration of Independence and other memorabilia; also a copy of the famous "Jefferson Bible" with an Introduction by the late Cyrus Adler, which was loaned by Mrs. Adler On Friday evening Jefferson's contribution to the arts will be signalized by an address on that subject and also by the performance by a string quartet of musical selections which were among his favorites On the whole we trust that this celebration may be worthy of one of the greatest members and officers of the American Philosophical Society and one of the greatest men in the history of our Nation

The chief intellectual theme of the Dinner at the close of the meeting will be the Bicentennial of the Founding of the American Philosophical Society, for it was on May 14, 1743, that Franklin published his *Proposal for Promoting Useful Knowledge among the British Plantations in America* A photographic copy of one of these *Proposals*, now in the Mason Collection of Frankliniana of Yale University, containing a letter from John Bartram the botanist to Cadwallader Colden, inviting him to become a member, will also be printed in the Jefferson Bicentennial issue of the PROCEEDINGS,[2] together with a photographic copy of a letter from Franklin to Colden, giving the names of the first nine members of the Society and saying that several meetings have been held to their mutual satisfaction. Significant extracts from this *Proposal* are the following·

> That One Society be formed of Virtuosi or Ingenious Men residing in the several Colonies, to be called *The American Philosophical Society* who are to maintain a constant Correspondence. . . .
>
> That a Correspondence already begun by some intended Members, shall be kept up by this Society with the ROYAL SOCIETY of *London*, and with the DUBLIN SOCIETY
>
> *Benjamin Franklin*, the Writer of this Proposal, offers himself to serve the Society as their Secretary, till they shall be provided with one more capable.

The principal address on this occasion will be on "The Beginnings of the American Philosophical Society"

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[1] Vol 87, no 3

[2] Vol 87, no 3, pls III, IV, V, and VI.

WHAT IS STILL LIVING IN THE POLITICAL PHILOSOPHY OF THOMAS JEFFERSON?

CARL BECKER

Cornell University

(*Penrose Lecture, April 22, 1943*)

I believe . . . that there exists a right independent of force.—THOMAS JEFFERSON

MANY nations have traced their history back to a fabled Golden Age, to the beginning of created things, when, as Hesiod says, "men lived like Gods, free from toil and grief." Our own history can likewise be traced, through its European origins, back to that mythical time. But we commonly think of it as beginning more recently, somewhat abruptly, in the clear light of day, with the settlement of Jamestown, the landing of the Mayflower, and the founding of Massachusetts Bay colony. Men did not then live like Gods, or free from toil and grief, but there were in those days men of heroic stature, men around whom myths have gathered, and whom we delight, with good reason, to honor. The beginning of our history as an independent nation is still more recent, and still more open to critical inspection in the still brighter light of the eighteenth century, and yet this is for us still more truly the time of our Golden Age, and of our ancestors of heroic stature. Among the founders of our federal republic (to name only the most distinguished) were Washington, Franklin and John Adams, Alexander Hamilton and John Jay, Robert Morris and James Wilson, Richard Henry Lee, James Madison, and Thomas Jefferson. No doubt we are apt to magnify these "Fathers" beyond their just merits. Their just merits were, nevertheless, sufficiently great, for it would be difficult to find, in the history of any other country, or in the history of our own country at any other time, within a single generation, as many statesmen in proportion to the population equally distinguished for learning, probity, and political intelligence. And of these ten men, none exhibited these qualities to better advantage or more lasting effect than Thomas Jefferson.

Jefferson, like Franklin, attained an international eminence; like Franklin he was familiar with all of the ideas of his time, contributed something to its accumulated knowledge, and was identified with its most notable activities and events. There was indeed scarcely anything of human interest that was alien to his curious and far-reaching intelligence. Nevertheless, his name is for us inevitably associated with a certain general idea, a certain way of regarding man and the life of man, a certain political philosophy. The word that best denotes this political philosophy is democracy. More than any other man we think of Jefferson as having formulated the fundamental principles of American democracy, of what we now like to call the American way of life.

Any significant political philosophy is shaped by three different but closely related influences. The first is what Alfred North Whitehead has taught us to call the "climate of opinion"—those unconsciously accepted presuppositions which, in any age, so largely determine what men think about the nature of the universe and what can and cannot happen in it, and about the nature of man and what is essential to the good life. The second is more specific: it derives from the political conflicts of the time, which dispose groups and classes to accept a particular interpretation of current ideas as a theoretical support for concrete political measures. The third is still more specific: it derives from the mind and temperament of the individual who gives to the philosophy its ordered literary form. Whatever is original in the philosophy is usually contributed by the individual who gives it this form. Whatever value it has for its own time depends largely upon the extent to which it can be used to illuminate or resolve the particular political issues of that time and place. But its value for other times and places will depend upon the extent to which the fundamental presuppositions on which it rests have a universal validity—the extent to which they express some essential and enduring truth about nature and the life of man.

The political philosophy of Thomas Jefferson

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 3, JULY, 1943

was not in its fundamental principles original with him. It was his only in the sense that he gave to ideas widely current, and genuinely entertained by him, a Jeffersonian form and flavor. Nowhere is this peculiarity of form and flavor so evident as in the famous Declaration of Independence, but Jefferson did not claim that the ideas themselves were in any way novel. Some years later his old friend John Adams, a little irritated (as he was apt to be on slight provocation) by the laudation of Jefferson as the author of the Declaration, protested to Pickering that there "is not an idea in it but what had been hackneyed in Congress for two years before."[1] To this Jefferson replied that it was not his purpose "to find out new principles, to say things that had never been said before, but to place before mankind the common sense of the subject," and to harmonize the "sentiments of the day, whether expressed in conversation, in letters, printed essays, or the elementary books of public right."[2] This was indeed Jefferson's merit, and the high value of the Declaration for his own time, that it expressed in lucid and persuasive form ideas then widely accepted, and thereby provided a reasoned justification for renouncing the authority of the British government. But the Declaration purports to have a higher value than that, for in providing reasons for renouncing the authority of a particular government at a particular time, Jefferson took occasion to formulate the universal principles that, as he believed, could alone justify the authority of any government at any time.

These principles are formulated in a single paragraph. We are all familiar with it, having read it or heard it read many times. But it will always, and certainly at no time more than now, bear repeating, and I will therefore repeat it once more, not precisely as it appears in the Declaration, but as Jefferson first wrote it in the original draft.

> We hold these truths to be sacred and undeniable, that all men are created equal and independent, that from that equal creation they derive rights inherent and inalienable, among which are the preservation of life, and liberty, and the pursuit of happiness, that to secure these rights governments are instituted among men, deriving their just powers from the consent of the governed, that whenever any form of government shall become destructive of these ends, it is the right of the people to alter or to abolish it, and to institute new government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their safety and happiness.

This statement contains the sum and substance of Jefferson's political philosophy, which may be reduced to four fundamental principles: (1) that the universe and man in it is governed by natural law, (2) that all men have certain inherent natural rights, (3) that governments exist to secure these rights, and (4) that all just governments derive their authority from the consent of the governed. These principles, made explicit in our federal and state constitutions, are still the fundamental principles of our political system, and on this anniversary occasion, when we are fighting a desperate war to safeguard the political system that Jefferson did so much to establish, it is indeed appropriate for us to ask: What is still living in this political philosophy? In order to answer this question, I will break it down into two more specific questions. First, what did Jefferson understand by natural law and natural rights, and what form of government did he think best suited to secure these rights? Second, to what extent is his conception of rights and government still valid for us?

The doctrine of natural law and natural rights, as Jefferson understood it, was revolutionary only in the sense that it was a reinterpretation, in secular and liberal terms, of the Christian theory of the origin, nature, and destiny of man. As commonly understood in the eighteenth century, it was perhaps never better stated than by the French writer, Volney:

> Natural law is the regular and constant order of facts by which God rules the universe, the order which his wisdom presents to the sense and reason of men, to serve them as an equal and common rule of conduct, and to guide them, without distinction of race or sect, towards perfection and happiness.[3]

For Jefferson as for Volney, God still existed. But for them God the Father of Christian tradition had become attenuated into God the Creator, or First Cause. Having originally created the world for a beneficent purpose and according to a rational plan, the Creator had withdrawn from immediate and arbitrary control of human affairs to the dim recesses where absolute being dwells, leaving men to work out their own salvation as best they could But they could work out their salvation very well because the Creator had revealed his beneficent purpose, not in Holy Writ, but in the open Book of Nature, which all men by the light of reason could read and interpret. "Is it simple," exclaimed Rousseau, "is it natural, that God should have gone in search of Moses in order to speak to Jean Jacques Rousseau?" To Rousseau, to Jefferson and Volney, it seemed more natural that God should have revealed his beneficent purpose through his works, from which it seemed self-evident that the whole duty of man was to discover progressively, by studying his created works, the invariable laws of nature and of nature's god, and to bring their ideas, their conduct, and their social and political institutions into harmony with them

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[1] Charles Francis Adams, *Works of John Adams* 2: 514. Boston, 1850.

[2] *Writings of Thomas Jefferson* (Ford ed.) 7: 304, 407, 1896.

[3] *Oeuvres* (second ed.) 1: 249. Paris, 1826.

From this conception of natural law Jefferson and his fellows derived the doctrine that all men are created equal and are endowed by their creator with certain natural and imprescriptible rights. Many otherwise intelligent persons have thought to refute Jefferson by pointing out that all men are in fact not equal With the same ingenuity and poverty of imagination one might refute St Augustine's doctrine of the brotherhood of man by pointing out that all men are in fact not brothers. All men, St Augustine would have replied, are brothers in the sight of God, and Jefferson's doctrine of equality comes to the same thing—that all men are equal in the possession of a common humanity, and if they are not in fact equal, and have not in fact the same rights and privileges, the highest morality, both for the individual and for society, is to act always on the assumption that all men should be accorded, so far as is humanly possible, the same opportunities and consideration To act on this assumption would be, both for individuals and for society, to do the will of God and to live the good life

In this respect—in respect to the primary values of life— the natural rights philosophy of Jefferson was essentially at one with the Christian faith, but in respect to the means best suited to realize these values, it differed sharply from current official Christian teaching It denied that man is naturally prone to evil and error, and for that reason incapable, apart from the compulsion of church and state, of arriving at the truth or living the good life On the contrary, it affirmed that men are endowed by their Creator with reason in order that they may progressively discover what is true, and with conscience in order that they may be disposed, in the measure of their enlightenment, to follow that which is good It was perhaps the dominant quality of Jefferson's mind and temperament, as it was of so many men of his time, to have faith in the worth and dignity, the rational intelligence and good will, of the individual man, and it was for this reason that, in considering the means for achieving the good life, they relied so confidently upon the negative principle of freedom of the individual from social constraint—freedom of opinion, in order that the truth might prevail, freedom of occupation and of enterprise, in order that careers might be open to talent, and freedom from arbitrary political control, in order that no man might be compelled against his will

These freedoms were precisely what Jefferson meant by "liberty" as one of the inalienable rights of man, and it was through the fullest enjoyment of these freedoms that the "pursuit of happiness" would be most likely to end in happiness for the greatest number of men And so we arrive at the central idea of the natural rights philosophy in respect to the proper function of government the happy idea that the best way to secure the inalienable rights of man is just to leave the individual as free as possible to enjoy them, and that accordingly no form of government can secure them so well as the one that governs least This idea was so engaging that any one with an unbounded faith in the natural goodness of men, and an equal faith in the validity of formal logic, might easily push straight on to the conclusion reached by Proudhon—the conclusion, namely, that "property is theft," that all governments exist to condone it, and that men will never be free and happy until all governments are abolished

Jefferson had not sufficient faith either in the native goodness of men or in formal logic ever to reach that conclusion He had more faith in the goodness of men than many of his contemporaries—more, for example, than John Adams, but less than some others—less, for example, than Samuel Adams or Thomas Paine. He had a logical mind, and relied upon it, but logic was not for him a "systematic way," as has been said, "of going wrong with confidence"—not, that is to say, a device for manipulating empty concepts in the void in vain, but a means of reaching sound practical conclusions on the basis of knowledge and common sense History and political experience, rather than the logic of political theory, convinced Jefferson that men had been governed too much, and above all too arbitrarily, by kings claiming divine right, and that among the institutions that obscured the native goodness of men by depriving them of equal rights none was less defensible than a hereditary aristocracy enjoying privileges that were unearned and exacting a deference that was unmerited. It seemed to him self-evident, therefore, that the people could govern themselves better than kings and aristocrats, whose powers and privileges rested upon the accident of birth, could do it for them. Not that the people could govern themselves with perfection, or without difficulty. All forms of government, he was aware, had their evils, and of popular government the principal evil, he said, was "turbulence, but weigh this against the oppressions of monarchy, and it becomes nothing."[4]

The evils of government by the people were even less than nothing when compared with its virtues, its chief virtue being that "it is the only form of government that is not eternally at open or secret war with the rights of mankind."[5] But what, in concrete instances, did Jefferson mean by "the people" who have a right to govern themselves? The people, in this sense, might mean all the people in the world, or all the people in Virginia, or all the people composing a particular race or sect. Practical statesman that he was, Jefferson took the world, politically speaking, as he found it, divided into groups that by tradition and community of interest regarded themselves, and were commonly regarded, as "nations." For purposes of government, all such nations might at any time "assume, among the powers of the earth, the separate and equal station, to which the laws of nature and of nature's God entitle them." Thus nations as well as individuals had their natural rights—the right of political self-determination. But how was this self-determination to be effected, how was the consent of the governed to be obtained? Any nation is composed of individuals, and individuals necessarily differ in their opinions and their interests, and it seemed to Jefferson self-evident that the only practicable way of reconciling these differences was by majority vote. Even a monarchy with all of its trappings, or an aristocracy with all of its privileges, if really supported by a majority vote, would be a "just government" because it would rest on the "consent of the governed."

Not that majority vote conferred on the majority of the moment any fundamental right not shared by the minority. It was merely a practical device imposed upon individuals bound by their nature to live together, and aiming to live together with the maximum degree of harmony and good will, and Jefferson justified it by saying that this rule once disregarded, "no other remains but force, which ends necessarily in military despotism."[6] There is, of course, no more fundamental or obdurate problem in political philosophy than that of the conflicting interests of the one and the many—the difficulty being to reconcile the desirable liberties of the individual with the necessary powers of society, and Jefferson was not more successful than other philosophers in providing a satisfactory solution of it. His solution, such as it was, is presented in a letter to Dupont de Nemours,[7] some portions of which I venture to quote, because in it he states briefly and categorically, and better perhaps than anywhere else, the chief tenets of his political faith.

> I believe with you that morality, compassion, generosity, are innate elements of the human constitution; that there exists a right independent of force, that the right to property is founded on our natural wants, in the measure with which we are endowed to satisfy these wants, and the right to what we acquire by those means without violating the similar rights of other sensible beings, that no one has a right to obstruct another exercising his faculty innocently for the relief of sensibilities made a part of his nature, that justice is the fundamental law of society, that the majority, oppressing an individual, is guilty of a crime, abuses its strength, and by acting on the law of the strongest breaks up the foundations of society, that action by the citizens in person, in affairs within their reach and competence, and in all others by representatives, chosen immediately, and removable by themselves, constitutes the essence of a republic, that all governments are more or less republican in proportion as this principle enters more or less into their composition, and that government by a republic is capable of extension over a greater surface of country than any other form.

The right of national self-determination, and republican government based upon popular suffrage and majority vote—these were Jefferson's fundamental ideas as to the form of government best suited at any time and in any country to secure the natural rights of man Turning then from the proper form of government to its function, we find that Jefferson would confine its activities within narrow limits In the passage just quoted, and in Jefferson's writings generally, we can note his disposition to believe that man is naturally good but that men are prone to evil, or, translating it into political terms, that citizens in the mass are to be trusted but that citizens elected to office need to be carefully watched I have quoted Jefferson as saying that the chief evil of republican government is "turbulence", but he did not really think so Indeed, he said that a little turbulence on the part of the people now and then would do no harm, since it would serve to remind elected officials that their authority was after all only a delegated and limited franchise from the people What Jefferson really believed is that political power is inherently dangerous, and that accordingly the chief evil in any form of government is that there may be too much of it From this it followed that in devising a republican government the chief aim should be to avoid that danger by dispersing power among individual magistrates, separating it in respect to function, and otherwise limiting it by applying the grand negative principle of checks and balances. Fundamentally, Jefferson agreed with Thomas Paine, that whereas society is the result of men's virtues, government is the result of their vices, and therefore a necessary evil necessary in order to preserve order, protect property, and guarantee contracts, evil because inherently prone to magnify its authority and thereby impair the liberties of the individual

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[4] *Writings of Thomas Jefferson* (Ford ed.) 4 362, 1894.

[5] *Ibid.* 5 147, 1895.

[6] *Ibid.* 10 89, 1899.

[7] *Ibid.* 10 24, 1899.

Jefferson's ideal of democratic society and republican government could best be realized in a small agricultural community, such as he was familiar with at Monticello, composed of a few men of substance and learning like himself and his friend James Madison, and otherwise chiefly of industrious, upstanding yeoman farmers, making altogether a community of good neighbors, in which every one knew who was who, and what was being done and who was doing it The affairs of such a community, being easily within the "reach and competence" of the people, could be managed by them with the minimum of officials, exercising the minimum of authority, and attended with the minimum of palaver and ceremonial display. Unfortunately, this ideal community could not live to itself, and since this was so it was necessary for the people, in managing the affairs of the wider region, to delegate their authority to representatives This departure from the ideal was the beginning of danger, but there was no help for it except to prepare for the danger in good time by electing representatives for very short terms and limiting their powers to very specific matters

The broad principle would then be that the wider the area the less safe it would be to entrust representatives with power, from which it followed that representatives from the counties to the state capital of Virginia could be safely entrusted with more power than could be safely entrusted to the representatives from Virginia to Philadelphia That the states must remain united, Jefferson fully realized, but he was convinced that the several states must retain their sovereign powers, and at first he thought the Articles of Confederation very nearly the ideal constitution for such a union When experience proved that a "more perfect union" was necessary, he approved of the Constitution of 1787, but insisted, as a guarantee against too much power in the hands of a government far removed from the people, that a bill of rights should be incorporated in the Constitution, and that the powers therein granted to the federal government should be strictly and narrowly interpreted [8] As it happened, Jefferson's grasp of political realities was destined to override this principle As President, he pushed through the purchase of Louisiana in spite of the fact that in so doing he was exercising an authority which he believed the Constitution did not confer upon him [9] That perverse circumstances should have made Thomas Jefferson the man to usurp power from the people is ironical enough, and it troubled his political conscience not a little, but he could reflect that he tried, although in vain, to get a constitutional amendment to authorize the act, and that in any case his conscience was clear since he had acted solely for the public good

Closely associated with Jefferson's fear of the open usurpation of political power, was his fear of the secret and more insidious influences by which men become debased and corrupted Republican government, he was aware, could not well succeed unless the majority of citizens were independent, honest, and reasonably intelligent. Intelligence could be sufficiently trained and directed by education—schools for the people and colleges for the leaders. But honesty and independence depended far less upon precept than upon the conditions in which men lived. The best conditions were those of country life. "Cultivators of the earth," Jefferson said, "are the most virtuous and independent citizens."[10] Vice and political corruption flourished, as he thought, chiefly in cities and the industrial communities that produce cities. In cities, where people were mostly unknown to each other, unscrupulous individuals could push their selfish interests under cover of the general indifference, and industrial communities, making so much of impalpable and evanescent forms of wealth, opened the door to speculation for unearned profit, stimulated greed, and rewarded conspicuous but useless luxury; provided all the conditions, in short, for the rise of a corrupt and politically influential "money power." Jefferson regarded a limited commerce and industry as necessary adjuncts of agriculture, but he had the farmer's settled antipathy to banks and their dubious financial manipulations. "The exercise, by our own citizens, of so much commerce as may suffice to exchange our superfluities for our wants," he cautiously admitted, "may be advantageous to the whole"; but he was profoundly convinced that it would be fatal for us "to become a mere city of London, to carry on the commerce of half the world at the expense of waging eternal war with the other half." Capital invested in agriculture and useful manufactures was productively employed; but "all of the capital employed in paper speculation is barren and useless, producing, like that on a gaming table, no accession to itself"; and as for banks, they are "a blot left in all our constitutions, which, if not covered, will end in their destruction."[11] Jefferson was never weary of pointing to England as the most ominous example of a nation rapidly losing its freedom by the unchecked multiplication of such evils; and he was convinced that the United States would suffer the same loss if it did not profit in time by that example.

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[8] *Ibid* 5 41–42, 45, 81, 1895

[9] Jefferson to R R Livingston, April 18, 1802 (*ibid* 8 143, 1897) This is the letter in which Jefferson made his famous statement that if France took possession of New Orleans, "we must marry ourselves to the British fleet and nation " Today we are again marrying ourselves to the British fleet and nation, and for essentially the same reasons given by Jefferson in justification of his statement.

Such in brief was Thomas Jefferson's political philosophy—his conception of human rights, and of the particular form of government best suited to secure those rights. What then is still living in this philosophy? To what extent is Jefferson's conception of rights still valid for us? To what extent is the form of government recommended by him well adapted for securing the rights, whatever they are, that need to be secured in our time?

Any careful study of Jefferson and his ideas is apt, sooner or later, to leave one with the general impression that he was more at home in the world of ideas than in the world of men and affairs. He had little of Franklin's salty zest for life in the rough, little of his genial, tolerant acceptance of men as they are, and none of his talent for being comfortable in crowds and hobnobbing with persons of every station, from kings to scullions in the kitchen. Jefferson was a democrat by intellectual conviction, but by temperament and training a Virginia aristocrat—a man of cultivated tastes and preferences, with a fastidious aversion from what is vulgar and boisterous, passionate and irrational and violent in human intercourse. One may say that he felt with the mind as some people think with the heart. John Adams said that his writings were characterized by "a peculiar felicity of expression."[12] They were indeed—perhaps a little too much so. In reading Jefferson one feels that it would be a relief to come, now and then, upon a hard, uncompromising, passionate sentence, such as "As for me, give me liberty or give me death." What one expects to find is rather: "Manly sentiment bids us to die freemen rather than to live as slaves." Jefferson's ideas had also this felicity, and also perhaps a little too much of it. They come to birth a little too easily, and rest a little precariously on the aspirations and ideals of good men, and not sufficiently on the brute concrete facts of the world as it is. Jefferson was no visionary, and in his policy in respect to the purchase of Louisiana he exhibited a masterly grasp of international political realities, but it is characteristic of him that, in respect to the Embargo, he should have taken the position that our neutral rights, since they were in theory equally violated by France and England, should be impartially defended against both countries, even though England alone was able to do us any injury in fact; characteristic also that the high intention of his method of defending those rights was to attain the object by humane and peaceful means, and its signal effect to inflict a greater material injury on the United States than it did on the countries by which our rights had been violated One suspects that with a little more humane feeling and a great deal more passion in his make-up, Jefferson would have been an out-and-out non-resistance pacifist, as it is he presents us with the anomaly of a revolutionist who hated violence, and a President of the United States who was disconcerted by the possession of political power

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[10] *Ibid.* 3: 279, 1894.

[11] *Ibid.* 10: 28, 1899.

[12] Charles Francis Adams, *Works of John Adams* 2: 514, 1850.

If Jefferson was more at home in the world of ideas than in the world of men and affairs, it follows, more or less as a consequence, that, as a political philosopher, he was a better judge of ends than of means. In all that relates to the fundamental values of life, both for the individual and for society, in all that relates to the ideal aims that democratic government professes to realize, his understanding was profound But in respect to the means, the particular institutional forms through which these values and ideal aims were to be realized, he was often at fault, if not for his own time at least for the future And when he was at fault, he was so partly because he conceived of society as more static than it really is, partly because he conceived of American society in his time as something that could, by relatively simple political devices, be kept relatively isolated and with slight changes be preserved in its relatively Arcadian simplicity But his chief limitation as a political philosopher (and one should in fairness remember that it was the chief limitation of most political thinkers of his time) was that he was unduly influenced by the idea that the only thing to do with political power, since it is inherently dangerous, is to abate it Jefferson did not sufficiently recognize the harsh fact that political power, whether dangerous or not, always exists in the world and will be used by those who possess it, and as a consequence of this failure he was too much concerned with negative devices for obstructing the use of political power for bad ends, and too little concerned with positive devices for making use of it for good ends.

This gives us, in general terms, the answer to our questions. In respect to fundamentals, Jefferson's political philosophy is still valid for us; in respect to what is more superficial—in respect to certain favorite institutional forms—it is outmoded In elaborating this general answer I can note only the salient points

None of Jefferson's ideas are so irrelevant to our needs as those about banks and speculation, cities and industrial communities—not because there is not much truth in what he had to say about them, but because his hope that the United States might be kept a predominantly agricultural society was entirely misplaced During Jefferson's time there was occurring, insidiously and without blare of trumpets, a revolution of which he was unaware, or the profound significance of which at all events he quite failed to grasp I refer of course to the Industrial, or more properly the Technological, Revolution occasioned by the discovery and application of steam power, electricity, and radiation It is now obvious that this was one of the two or three major revolutions in the history of civilization Within a brief span of years, by giving men unprecedented power over material things, these discoveries have transformed the relatively simple agricultural societies of the eighteenth century into societies far more complex, more integrated, and at the same time more mobile and swiftly changing than any ever known before—formidable, blank-faced leviathans that Thomas Jefferson would have regarded as unreal, fantastic, and altogether unsuited to liberty and equality as he understood those terms That Jefferson did not foresee this momentous revolution is no discredit to him, no one in his time foresaw it more than dimly But the point is that the societies created by this revolution are the societies in which we live, and in connection with which we have to consider anew the nature of human rights, and it is now obvious that the favorite doctrine of Jefferson and of his time, the doctrine of *laissez-faire* in respect to economic enterprise, and therefore in respect to political policy also, can no longer be regarded as a guiding principle for securing the natural rights of men to life, liberty, equality, and the pursuit of happiness

The doctrine of *laissez-faire*, as it was understood by Jefferson and the early nineteenth-century social philosophers, rested upon the assumption that if each individual within the nations, and each nation among the nations, attended to its own interests, something not themselves, God or Nature, would do whatever else was necessary for righteousness Or, better still, as Professor Edward H Carr has put it in his recent book, the doctrine was based on the assumption that from the unrestrained pursuit of individual self-interest a "harmony of interests" would more or less automatically emerge [13] In the political realm this meant that the function of government should be limited in principle to the protection of life and property, the enforcement of contracts, the maintenance of civil order, and the defense of the country against aggression In the economic realm it meant that the free play of individual initiative, stimulated by the acquisitive instinct, would result in the maximum production of wealth, and that the competitive instinct, operating through the price system, would result in as equitable a distribution of wealth as the natural qualities and defects of men permitted In the international realm it meant that the strict attention to national interest and power by each sovereign state, restrained by the recognized rules of international law, would tend to create a balance of interests and of power which would serve, better than any other method, to promote international commercial exchanges and cultural relations and to preserve the peace

It is now sufficiently clear that this doctrine of *laissez-faire*—of letting things go--however well adapted it may have been to the world in which Jefferson lived, is no longer applicable to the world in which we live In a world so highly integrated economically, a world in which the tempo of social change is so accelerated, and the technological power at the disposal of individuals and of governments is so enormous and can be so effectively used by them for anti-social ends – in such a world the unrestrained pursuit of self-interest, by individuals and by states, results neither in the maximum production or the equitable distribution of wealth, nor in the promotion of international comity and peace, but in social conflicts and global and total wars so ruthless as to threaten the destruction of all interests, national and individual, and even the very foundations of civilized living In our time the right to life, liberty, and the pursuit of happiness can be secured, not by letting things go and trusting to God or Nature to see that they go right, but only by deciding beforehand where they ought to go and doing, so far as possible, what is necessary to make them go there The harmony of interests, if there is to be any, must be deliberately and socially designed and deliberately and co-operatively worked for. To bring this harmony of interests to pass is now the proper function of government, and it will assuredly not be brought to pass by any government that proceeds on the assumption that the best government is the one that governs least

The history of the United States for the last hundred years confirms this conclusion, and nullifies for us Jefferson's favorite idea that the function of government should be reduced to a minimum, that sovereign rights should be retained by the states, and that the powers of the federal government should be strictly and narrowly interpreted Decade by decade the states have gradually lost their sovereign powers, and the federal government, by virtue of a liberal interpretation of the Constitution and of amendments to it, has assumed powers that have been used to limit the freedom of some individuals in order to protect the freedom of others This extension of power and expansion of function on the part of the federal government has been brought about, in spite of the inertia of traditional ideas and the pressure of interested groups, by the insistent need of regulating the activities of powerful corporations which, although regarded in law as private enterprises, are in fact public utilities, and which therefore enjoy irresponsible power which they are sometimes unwilling but more often unable to use for the public good It is in this respect that the engaging word "liberty" now appears in a guise unknown to Jefferson and his contemporaries In the eighteenth century the obvious oppressions, for the majority of men, were those occasioned by arbitrary governmental regulation of the activities of the individual, so that liberty could be most easily conceived and understood in terms of the emancipation of the individual from social constraint But in our time the principle of free enterprise has created a situation in which the obvious oppressions, for the majority of men, are those that arise not from an excess of governmental regulation but from the lack of it, so that liberty can now no longer be understood in terms of political and economic *laissez-faire*, but only in terms of more and more intelligent social regulation of economic enterprise Jefferson and his contemporaries, as James Bryce has well said, "mistook the pernicious channels in which selfish propensities had been flowing for those propensities themselves, which were sure to find new channels when the old had been destroyed."[14] The selfish propensities with which we have to deal are the same as they were in Jefferson's time, but since the channels—the institutions and customs—in which they flow are different, the remedies must be different also

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[13] *The Conditions of Peace* 105, 1942

[14] *Modern Democracy* I 14, 1921.

In this respect—in respect to his idea of the proper function of government--the philosophy of Jefferson is now outmoded But this is after all the more superficial aspect of Jefferson's philosophy, and if we turn to its more fundamental ideas—the form of government as distinct from its function, and the essential rights to be secured as distinct from the specific means of securing them—we find that Jefferson's political philosophy is as valid for our time as it was for his

That the republican form of government—that is to say, government by elected representatives and magistrates—is the best form Jefferson was convinced because, as he said, it "is the only form of government that is not eternally at open or secret war with the rights of mankind." The republican form of government, which Jefferson helped to organize under the Constitution of 1787, still exists essentially unchanged, and today we accept it with even less qualification and divided loyalty than obtained in Jefferson's time We accept it for many reasons, no doubt—because it has on the whole worked so well, because we have become habituated to it, and because there is nothing in our political traditions to provide us with a model of any other form But we also accept it for the same fundamental reason that Jefferson accepted it—from the profound conviction that it is the only form of government that is not at war with the natural rights of mankind, or at all events with those familiar rights and privileges which we regard as in some sense natural because from long habituation they seem to us so imprescriptibly American.

Recent events have greatly strengthened this conviction Some twenty years ago we were in a mood to ask whether the representative system of government might not be, if not at open, at least too often at secret war with the rights of mankind That was a mood induced by comparing the democratic practice with the democratic ideal, with the inevitable if perhaps salutary result of magnifying the defects and minimizing the virtues of the democratic system as a going concern But for ten years past we have been permitted, have indeed been compelled, to reappraise the democratic system with all of its defects in the light, not of the democratic ideal, but of the practical alternative as exhibited for our admiration in Germany and elsewhere, and the result of this reappraisal has been to make it clear that the defects of our system of government are after all, in comparison, trivial, while its virtues are substantial Indeed, the incredible cynicism and brutality of Adolf Hitler's way of regarding man and the life of man, made real by the servile and remorseless activities of his bleak-faced, humorless Nazi supporters, has forced men everywhere to reexamine the validity of half-forgotten ideas, and to entertain once more half-discarded convictions as to the substance of things not seen One of these convictions is that "liberty, equality, fraternity," and "the inalienable rights of man" are generalities, whether glittering or not, that denote realities—the fundamental realities that men will always fight and die for rather than surrender

It is in defense of these rights, and of the democratic or republican form of government, that we are now fighting a desperate war, and we justify our action by the very reasons advanced by Jefferson—that the democratic form of government is the form best suited to secure the inalienable rights of man We may be less sure than Jefferson was that a beneficent intelligence created the world on a rational plan for man's special convenience We may think that the laws of nature, and especially the laws of human nature, are less easily discovered and applied than he supposed We may have found it more difficult to define the rights of man and to secure them by simple institutional forms than he anticipated Above all, we have learned that human reason is not quite so infallible an instrument for recording truth as he believed it to be, and that men themselves are less amenable to rational persuasion Nevertheless, in essentials the political philosophy of Jefferson is our political philosophy, in essentials democracy means for us what it meant for him

Democracy is for us, as it was for him, primarily a set of values, a way of regarding man and the life of man It is also for us, as it was for him, a set of concrete institutions devised for the purpose of realizing those values We understand, as he did, but rather more clearly than he did, that the concrete institutions are bound to change they have changed in many ways since Jefferson's time, they are changing now, and they will change even more in time to come. But we may believe, as Jefferson did, that the essential values of life are enduring, and one reason for believing so is that the values which we cherish are those which Jefferson proclaimed, and which for more than two thousand years the saints and sages of the world have commonly regarded as the ideal end and ultimate test of civilized living. If we were to write a modern declaration of the democratic faith, it might run somewhat as follows:

> We hold these truths to be self-evident: that the individual man has dignity and worth in his own right; that it is better to be governed by persuasion than by force; that fraternal good will is more worthy than a selfish and contentious spirit; that in the long run all values, both for the individual and for society, are inseparable from the love of truth and the disinterested search for it; that the truth can be discovered only in so far as the mind of man is free; that knowledge and the power it confers should be used for promoting the welfare and happiness of all men rather than for serving the selfish interests of those individuals and classes whom fortune and intelligence have endowed with a temporary advantage; and that to secure these high aims in the life of man no form of government yet devised is so well adapted as one which is designed to be a government of the people, by the people, and for the people.

To this declaration of the modern democratic faith Thomas Jefferson would, I feel sure, have subscribed without qualification. And it is in this sense, the most important sense of all, that his political philosophy, and still more the humane and liberal spirit of the man himself, abides with us, as a living force, to clarify our aims, to strengthen our faith, and to fortify our courage.

JEFFERSON AS A LAWYER

ROLAND S. MORRIS

President of the American Philosophical Society, 1932-1942

(*Read April 22, 1943*)

I DEEPLY appreciate the opportunity which the Society has given me during this memorial meeting dedicated to Thomas Jefferson to speak briefly of his experience and achievement, as well as his training, as a lawyer. The history of Jefferson's legal career has had a varied course. In the first and second generations after his death, in 1826, the earlier of Jefferson's biographers, with limited material at that time, endeavored to deal quite fully with this phase of Jefferson's activities. Thus Randall, who wrote in 1848, devotes considerable space to reciting such facts as he could gather covering Jefferson's early life as a lawyer. Much material available today was not available to him then, but at that date the tradition persisted that Jefferson had an outstanding legal education and for some years a most successful legal career.

This was followed by Parton, whose *Life of Jefferson*, which still remains a valuable reference, made a fairly careful study of Jefferson's early career. The substance of what he concluded in his *Life*, which was published in 1874, was contained in a series of articles appearing in the *Atlantic Monthly* for the year 1872. These articles included "Jefferson a Student of Law," published in February of that year, "Thomas Jefferson a Virginia Lawyer," published in March of that year; and following in the same volume of the *Atlantic Monthly* was an article on "The College Days of Thomas Jefferson." These were all preliminary chapters to the *Life* which was published two years later.

Mr. Randall, in his *Life*, takes notice of certain reflections on Jefferson as a lawyer, and concludes with the following summary:

> Of his ability as a lawyer, most substantial proofs remain. They are to be found in his portion of the revision of the Laws of Virginia and we may add in the actual post of pre-eminence assigned to him in that position by such colleagues as Wythe and Pendleton, in his reports of the decisions of the General Courts of Virginia, in his notes on Virginia and his written opinions and papers as Secretary of State, in his Parliamentary Manual, in his correspondence and in the multitude of citations and annotations scattered through his writings. Taken together, no intelligent investigator will presume to deny that they show him to have been one of the learned and discriminating lawyers of the period, when wide and profound erudition was probably more common, or, at least more universal in the American Bar than now.

In spite of this tribute paid almost a century ago, a sort of tradition has persisted that Jefferson was not interested in being, or fitted for, a lawyer. Even as late as last year, Mr. Padover, in his *Life of Jefferson*, while admitting that Jefferson had a brilliant education in the law, would seem to deny him the right to be called a lawyer. "It cannot be denied," he says, "that Jefferson was not cut out to be a lawyer,—a scholar, a scientist, an inventor, an architect, a botanist—Yes, but not a lawyer. His mind was too inquisitive, too speculative, and, above all, too much given to ideas as such, to be happy in the arid wastes of jurisprudence." Leaving aside this rather disparaging reference to the absence of ideas as an adequate preparation for the law, I hope I may be able to show that it was possession of ideas, of inquisitiveness, and of a speculative temperament that made Jefferson the useful and constructive lawyer that he was.

It is also a singular fact that in the description of Thomas Jefferson in the opening sentence of his "Life" in the *Dictionary of American Biography*, he should be described as "a statesman, diplomat, author, scientist, architect, and an apostle of freedom and enlightenment." Thus Jefferson the lawyer is ignored entirely in this description.

It is well for us to remember that Jefferson spent five years as a student of the law, that he spent the succeeding seven years in the active practice of his profession, and that subsequently, for more than two years, he devoted himself almost exclusively to a reform in the laws of Virginia. These latter efforts subsequently found expression in the amendments modernizing the Virginia law, and followed very closely the principles which he had expressed as a result of research in that field All this study and experience represent some 15 years of devotion to the law, which gave Jefferson the background of knowledge and experience which had a profound influence on his own mental development, as well as on the development of the law, not only in his own state, but in other states of the Union subsequent to the American War of Independence

This minimizing of Jefferson's legal career is in part due to Jefferson himself In the fragment of his "Autobiography" which he wrote for the benefit of his family when he was 77 years old, after a tribute to the influence of Dr William Small, who was a professor at the College of William and Mary during his graduate days, he says that Small returned to Europe in 1762,

> having previously filled up the measure of his goodness to me by procuring for me from his most intimate friend George Wythe a reception as a student of law, under his direction introduced me to the acquaintance and familiar table of Governor Fauquier, the ablest man who had ever filled that office Mr Wythe continued to be my faithful and beloved mentor in youth and my most affectionate friend through life

And then in a concluding sentence, and with characteristic modesty, Jefferson sums up his days of practice by this one statement: "In 1767 he led me to the practice of the law at the Bar of the General Court, at which I continued until the Revolution shut up the Courts of Justice"

Jefferson was most fortunate in his legal preceptor George Wythe was largely a self-educated man He achieved a brilliant career in the law. Admitted to the Bar of Virginia in 1746, it was not until 12 years later that he became the leader of the Virginia Bar He subsequently became a signer of the Declaration of Independence on behalf of Virginia, a professor of law, and Chancellor of Virginia No young man could have chosen a better equipped preceptor.

In this background may I take occasion to repeat a few facts of Jefferson's education in the law, of his achievements in the practice of law, and of those reforms in the substance of the law of which he was, to use his own words, "the mover and draughtsman."

Speaking of his college days, and of his introduction to the field of knowledge, Jefferson says in his "Autobiography".

> It was my great good fortune, and what probably fixed the destinies of my life, that Dr Wm Small of Scotland was then professor of Mathematics, a man profound in the most useful branches of science, with a happy talent of communicating correct and gentlemanly manners, & an enlarged & liberal mind He, most happily for me, became soon attached to me & made me his daily companion when not engaged in the school, and from his conversation I got my first views of the expansion of science & of the system of things in which we are placed Fortunately the philosophical chair became vacant soon after my arrival at college, and he was appointed to fill it per interim and he was the first who ever gave in that college regular lectures in Ethics, Rhetoric & Belles lettres.

We have an unusual amount of material covering the variety and extent of Jefferson's legal studies—perhaps more detailed than that of any other great American jurist In order to appreciate what this young student accomplished, the state of legal literature at that time should be considered

There was not a single American report or treatise then in existence English and Continental works were not plentiful Textbooks, as we of the American Bar now know them, were then hardly known at all In legal literature it was the age of abridgments like Bacon, Rolle and Viner, or commentaries by Coke, Plowden, and Bracken *Coke's Notes to Littleton* were cited most often Reports of significant cases in English courts were just beginning to circulate generally

It was in this existing field of publication that Jefferson labored with characteristic industry. He early deeply studied, carefully digested, and completely mastered *Coke on Littleton*, which he said was in his days the universal elementary book of law students. The care with which he worked, and, in a measure, what thoughts his studies inspired are revealed to us in his, now well-known, notes on his legal studies, which he faithfully kept in a commonplace book during his days as a student, and which he continued during the early portion of his practice. These notes contain abstracts of cases in the Equity and Common Law Courts, such as Vernon's *Chancery Reports*, Lord Kame's *Principles of Equity*, Peer Williams' delightful and amazingly personal *Reports*, and Finch's *Precedents in Chancery*. In the English law reports then available, there are notes and references to the reports of cases argued before the King's Bench, Salkeld's Reports on cases in the King's Bench, and Raymond's Reports of cases argued and adjudged at the Court of the King's Bench and Common Pleas. What impresses one in these abstracts and notes is the knowledge of the common law principles which they exhibit, and the maturity of Jefferson's critical and constructive ideas The years he had spent in careful reading and in researches in the origins of the common law, together with his attendance at the hearings before the General Court at Williamsburg during these student years, justify the statement that he was preparing himself with rare industry and devotion for the practice of his profession I think it is safe to state that no young man of his generation in the colonies was his equal in both the width and depth of his knowledge

Everything that I have examined of his early papers, his correspondence, and his subsequent reference to those student days would indicate that he was supremely happy in his work, that he looked forward to the law as his career, and that he valued all his life the knowledge which he obtained during those years of intensive study and wide reading

Let us turn now, for just a moment, to Jefferson's achievements in the actual practice of the law

As already stated, he was admitted to practice at the Bar of the General Court in 1767, and he continued in active and most successful practice until August 11, 1774, when he surrendered his law business to Edmund Randolph His success as a lawyer was striking During his first year he was employed in 68 cases, and for the four following years his practice steadily increased From the records which have been so carefully studied in recent years, his steady rise in practice tells its own tale In his second year he acted as counsel for 115 cases in the General Court, in 1769 for 198, in 1770 for 221, in 1771 for 237 In 1772, owing to his increasing absorption in the political relations between the Colonies and Great Britain, there was a fall in his practice to 154 cases. In 1773 the number dropped to 127, and during the months that he remained in active practice during 1774 the number had dropped to 29 It was in August of that year that he finally decided that his obvious duty was, for the present at least, to abandon active practice and devote himself to the vital and challenging interests of Virginia and its sister Colonies. These figures I have cited refer only to the cases in which he participated before the General Court He also appeared constantly before the County Courts

Such records as we have of his travels exhibit an almost appalling industry The importance and character of his clients steadily increased, and many are the names of powerful individuals and families which appear in the records of his cases in the account books We have a very meticulously kept record of the fees which he charged, the amounts that were actually paid, and the amounts that were still owing He was evidently not as energetic in the collection of his fees as the present members of the Bar, and the amounts owing were in the aggregate considerably more than the amounts he actually received But, nonetheless, it is true that his earnings were substantial, considering the purchasing value of money at that time They in themselves represent an unusual activity in practice, when we recall the limitations that were set by the laws of Virginia on compensation of lawyers

It should be noted as a fact, that at the time he was called to the Bar of Virginia and in the subsequent years opportunities for legal work were unusual. Virginia was passing through an economic crisis As the population grew, many questions of land tenure and land boundaries existed unsolved The criminal law was outmoded, and in many respects called for drastic reform Debts were mounting and assets were falling When we allow for these conditions, we are compelled to conclude that Jefferson's career as a practicing lawyer was unique and almost meteoric in its success

When Jefferson turned from active practice, his years of study in law and in government and his experience as an active practitioner peculiarly fitted him for the tasks that now faced him He had reached definite conclusions on the legal rights of the Colonies His convictions were clear and deep-set on the natural rights of the individual in relation to government, with its powers and jurisdiction

It is not within my province to discuss Jefferson's statesmanship and his public policies, but I do pause merely for a moment to hazard the statement that only a superbly equipped lawyer could have drafted the Declaration of Independence, both in its form and in its substance

I do deem it pertinent, however, to note certain tenacious facts which were set in his mind by his studies and his experience in the law, which clearly colored his approach to the vital problems of American life.

In the first place, his early research in the history and development of the English Common

Law made him deeply distrustful of judge-made law Perhaps the most striking example of this general point of view was his early study of the legal dictum that Christianity was a part of the English Common Law. He could find no authority for this rule, either in the customary law of England or in any statutory enactments. It rested wholly on the reported statements of judges who, as he contended, found this maxim a useful instrument for the judicial practice of religious intolerance Again, from his studies and his experience, he acquired, and retained throughout his life, a profound faith in man's essential sense of justice It follows that Jefferson was a great admirer of the jury system, not only because of what he deemed its practical merit in the decision of causes, but also because it left an important function of government in the hands of the people He even proposed to extend the jury system into the Courts of Chancery, which, he says, "have already engulfed and continue to engulf so great a proportion of the jurisdiction over our property "

It is unnecessary to emphasize Jefferson's lifelong interest in education, and, in view of his experience as a lawyer, that he should give much thought to legal education. Perhaps I can best sum this up by referring to his attitude toward *Blackstone's Commentaries* The criticism which he expressed during his life of the effect of Blackstone on legal education reveals better than anything I know his general views on education for the law, and reveals him as totally at variance with legal education as he knew it in the early part of the nineteenth century and as it developed so rapidly after his death

For several generations *Blackstone's Commentaries* was the fundamental basis of legal education in America, and this would have been to Jefferson a matter of deep regret The first volume of *Blackstone's Commentaries* was published in 1765, and the last of the four volumes in 1769. I do not know just when Jefferson first read and studied Blackstone, but it must have been in the very early days of his practice He viewed the *Commentaries* as conservative, complacent, strongly sympathetic with things as they were, and sadly lacking in historic perspective or any great erudition They appeared superficial to one who, like Jefferson, had delved deep into the origin and principles of the common law

In view of the place that Blackstone attained in the teaching of law in America, it is interesting to note some of the comments on him which Jefferson made during his lifetime. Talking of legal education, he says:

> In my days Coke on Littleton was the universal elementary book of law students, and a sounder Whig never wrote, nor of profounder learning what were called British liberties Our lawyers were then all Whigs, but when his black letter text and uncouth but cunning learning got out of fashion and the honeyed words of Blackstone became the student's horn book, from that moment that profession (the nursery of all Congress) began to slide into Toryism and nearly all the young breed of lawyers are now of that line

On another occasion, later in life, in writing to Judge Tyler, he says

> A student finds in Blackstone a smattering of everything and is easily persuaded that if he understands that book he is a master of the whole volume of the law

He continues.

> The distinction between these and those who have drawn their stores from the deep and rich mind of "Coke on Littleton" seem to be well understood even by the unlettered common people who apply the appellation of "Blackstone lawyers" to these ephemeral insects of the law

Finally, as late as 1814, he says·

> Lawyers in love of country have been generally the supporters of free principles in their constitution, but there, too, they have changed I ascribe much of this to the substitution of Blackstone for my Lord Coke as an elementary work. In truth Blackstone and Hume have made Tory of all England, and are making Tories of those young Americans whose feelings of independence do not place them above the wildest sophistries of Tory Blackstone.

These are not the statements of an embittered old man living in the memories of his student days, but rather the expression of his definite conviction of the place of law in human affairs and the attitude in which one should approach it. He loved the ideals of exact justice. He believed that the law should be moulded and developed to meet that ideal. He recognized that human relations and associations are subject to change and development, and that any ideal that can be realized must be adjusted to those changing conditions. He loved to study the history of the law, but he thought of it as a living thing, which must continually adjust itself to the environment in which it exists. Throughout his life, in politics as in law, he had no patience with those who merely labored to maintain things as they are. On one occasion he wrote:

> Some men look at constitutions with sanctimonious reverence and deem them like the Ark of the Covenant, too sacred to be touched. They ascribe to the men of the preceding age a wisdom more than human and suppose that what they did is to be beyond amendment. *Law and institutions must* go hand in hand with the progress of the human mind. We might as well require of man to wear the coat that fitted him as a boy as civilized society to remain under the regime of their ancestors.

This deep-seated conviction of the necessary inevitable progress and adjustment of the law to social conditions rendered him almost intolerant of the type of lawyers, who, educated in the conservative views of Blackstone, were so consistently frustrating the proper development of legal thought. He was devoted to the memory of those lawyers who led the reforms, as Coke did in his day, and as Wythe and others did in the changing period of the closing years of the eighteenth century. I am bold to suggest that his attitude toward Blackstone and his influence on legal education was in general justified. It led to the phrase "mere lawyer," as expressive of a type of man who was narrow, limited, and technical.

It has been a great advantage to the profession that during the last 40 or 50 years legal education has, more and more, adopted the view of Jefferson as to the evolutionary processes of the law. With the adoption of the case system in our law schools, with its appreciation of historical backgrounds, the law has been greatly enriched. Men like Holmes and Brandeis in the last generations were pioneers in this change.

There is one more aspect of Jefferson's legal interests which is blended with his public policies and which constitutes the greatest contribution which he has made to American law. I of course refer to his law reforms which, though confined to Virginia, have set the pattern of early law reform throughout the United States.

I had made my notes on this subject before I had the opportunity to read Marie Kimball's "The Four Freedoms" as published in the *Virginia Quarterly Review*, devoted largely to a survey of certain aspects of Jefferson's life. She has there developed with rare skill and accurate scholarship the story of Jefferson's effort to realize in legal enactment the four freedoms which were so dear to his heart. Subsequent to the Declaration of Independence, in the early fall of 1776, Jefferson resigned from the Continental Congress, refused an appointment abroad as a representative of the Colonies, and rushed back to the Virginia Legislature to work on the reform of the Virginia Statutes, so far as to abolish feudal tenure inherited from the English law, and to obtain freedom of religion and a more modern approach to the problems of crime and punishment. For more than two years Jefferson devoted himself to this task. He did succeed during that period in reforming the courts, in abolishing the right of primogeniture, in modernizing the law of domestic relations and the laws of decedents' estates, and in modifying the cruelties of the old inherited views of crime and punishment. He did not succeed in abolishing slavery, and many of his proposals waited years before receiving formal legislative enactment. No one but a lawyer trained in legal history and procedure could have done the work that he did during those more than two years, and it remains undoubtedly the significant and lasting contribution which he as a lawyer made to the body of the law. No more just or more beautiful tribute has been paid to this aspect of Jefferson's activity in the law than that contained in Marie Kimball's closing paragraph in "The Four Freedoms," and I hope she will forgive me for quoting it as the conclusion to this paper:

> To this task, so stupendous that it was to have repercussions throughout the United States of America, Jefferson was to bring a boldness of conception, a maturity of thought, and an elevation of spirit that set him apart from all his fellow legislators, not excluding even George Wythe. It was as though he had already said to himself, as he was to write many years later, "I have sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man."

With this in his heart he set to work to bestow upon man, as has been remarked, the four great freedoms—the like of which had never been known. By destroying the last remnants of feudalism, the laws of entail and primogeniture, he gave man the freedom of the land, by advocating the abolition of slavery, the freedom of the body, by fostering universal education, freedom of the mind; and by the statute for religious freedom he conferred upon man the supreme boon, freedom of the soul.

THOMAS JEFFERSON—FARMER

M. L. WILSON

United States Department of Agriculture

(Read April 22, 1943)

"I return to farming with an ardor which I scarcely knew in my youth "[1] Thus wrote Jefferson in 1794 after eighteen years of public service, counting from his election as delegate to the Continental Congress through his tenure as Secretary of State Whatever Jefferson did, he did with his whole heart and being Endowed with strong mental health, he found life never dull, never boresome, it was filled with the wonders of nature, the growing things of the earth While in France he longed for Monticello As the period as Secretary of State drew to a close, he wrote, "I am then to be liberated from the hated occupation of politics, and to remain in the bosom of my family, my farm and my books "[2] Back at Monticello, after the long years of service from 1797 to 1809, he stated, "No occupation is so delightful as is the culture of the earth "[3]

We think of Jefferson as a great statesman, but more than this he was a statesman who lived on the land and liked farming He was a good farmer, but as such we might never have heard of him Many good farmers have made real contributions to agriculture, but, despite their part in the advance of husbandry, so close were they to the land, so far beyond the purview of historians, that their names all too frequently are unmarked in standard histories Indeed, as to Jefferson himself, though all his biographers mention his farming, some giving a chapter, others a few paragraphs, many have missed the significance of his work He was the scientist in the field "Agriculture," he believed, "is a science of the very first order It counts among its handmaids the most respectable sciences such as chemistry, natural philosophy, mechanics, mathematics generally, natural history, botany "[4]

IMPORTANCE OF AGRICULTURAL HISTORY

Jefferson's first great biographer, Henry Stephens Randall, practical farmer and noted writer on farming practices, was keenly appreciative of Jefferson's part in the development of American agriculture But the full-length life history which he undertook, with a devoted political partisanship, was of such scope that the space given farming was necessarily limited Today, however, the Agricultural History Society is in its twenty-fourth year, and the importance of historical interpretation from the agricultural, as well as the primary social, political, and economic viewpoints, is recognized If we are to know our present culture, we must understand our agricultural past Here, in this paper, some use has been made of but a small portion of the great body of agricultural materials which center about Jefferson's name. Only a portion of his own correspondence has been published, and in that portion, editors, working from a particular viewpoint, have sometimes made regrettable omissions of agricultural material Were the whole body of materials related to his farming available today, we would know more about Thomas Jefferson, the farmer, and also more about the great advance of agriculture in which he participated

LEADERS IN AGRICULTURE

Born in 1743 in the farmhouse, Shadwell, located on the heavy red Davidson soils of Albemarle County, Virginia, Jefferson was a prophet and a leader in the development of scientific agriculture in America. As a world figure in the profession, he was internationally known and honored by agricultural societies in Great Britain, France, and Italy as well as in our

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[1] Lipscomb, Andrew A , and Albert E Bergh (eds.), *The Writings of Thomas Jefferson* 9 283, 1903 (Letter to George Washington, April 25, 1794)

[2] Ford, Paul Leicester (ed), *The Writings of Thomas Jefferson* 6 455, 1895 (Letter to Mrs Church, November 27, 1793)

[3] Lipscomb and Bergh, *op cit* 13 79 (Letter to Charles Willson Peale, August 20, 1811)

[4] Lipscomb and Bergh, *op cit* 10· 429 (Letter to David Williams, November 14, 1803)

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own country. In connection with the development of the arts and sciences, it is customary to hang pictures of significant figures in college and university classrooms and public halls. Archimedes may be seen in the mathematics classrooms, Herodotus in those of history, Michael Faraday in the physics buildings, and Lavoisier in the chemistry halls. In the classrooms of the colleges of agriculture, in the vocational agricultural high schools, in the Grange halls, and the many meeting places of farmers today, the pictures of Washington and Jefferson nearly always hang side by side. Farmers are proud that the Father of their Country was a farmer, a good farm manager, and a practical farm businessman. But Jefferson's picture hangs among the immortals of agriculture for a different reason. As Vice President Henry A. Wallace has said, "It was Jefferson more than any man of his time who foresaw the fruitfulness of the application of science to agriculture."[1] We think of his greatness as a champion of the rights and as an example of the responsibilities of the individual. From the standpoint of agriculture, farmers identify him with the application of science to agriculture, the improvement of the plow, the advocacy of soil conservation, the development of the concept of the agricultural college, and the recognition of agriculture as a learned profession.

The Agricultural Revolution

Agriculture during Jefferson's lifetime was in a stage of transition. Science was still in its infancy, but the fetters of medievalism had been thrown off. Systematization of knowledge was taking place, and the enlightenment was spreading. The agricultural revolution to which pioneers such as Tull with his seed drills and intensive cultivation, Townshend with rotations, and Bakewell in cattle breeding, contributed so much, was in progress. The books of publicists, such as Arthur Young, were in wide circulation. Just as the work of Watt, and of others who contributed to the industrial revolution, was a projection of the work of physical scientists, so, supporting the technicians of agriculture, were the botanist, Linnaeus, the chemist, Lavoisier, and the many scientists who have contributed to our knowledge of the soil and growing things.

Developments in the United States

Leaders in the United States paid close attention to developments in the agricultural field. The minutes of the early agricultural society, the Philadelphia Society for the Promotion of Agriculture, record again and again not only appreciation of European innovations, but original improvements as well as adaptations of European practices to American conditions. Washington, at Mount Vernon, interested in practical results, put many experiments into effect. Jefferson, at Monticello, had not only the care of a large estate, but a fundamental training of such type and a pen of such facility as to enable him to contribute to the basic knowledge which served to carry the agricultural revolution forward.

Jefferson's early education was obtained in Virginia schools, located at some distance from the farmhouse, Shadwell, but his vacations were regularly spent at the home farm. At the College of William and Mary, he was fortunate in having as his teacher the natural philosopher, William Small, who had a deep effect on his character and who undoubtedly contributed much to his scientific turn of mind. After his admittance to the bar in 1767, Jefferson took charge of the family farms about Monticello and Shadwell. Available figures give some measure of his practical success in this respect. His inheritance of 1,900 acres was more than doubled before his marriage at the age of 29. The farms, all paid for, yielded an income of some $2,000 a year. In a land of corn and tobacco he preached and practiced diversified farming. Albemarle County in present season is white with the apple blossom and pink with the bloom of the peach.

Activities at Monticello

Jefferson's power of accurate observation with regard to plants, climate, and many other interests appear in the Garden Book. There is something symbolic of the growth of the great West, the farming center of the world, in Jefferson's planting of corn and other seeds brought back by the Lewis and Clark Expedition. His background of learning is indicated by use of Linnaean as well as common terms. The Garden Book is a depository of aesthetic appreciation, literary allusion, and practical provision for the table. Quantitative expression illustrates his scientific bent. When the first strawberries are gathered, they are not just strawberries of about a certain size, but rather, he writes on April 28, 1767, exactly so many of them fill a cup. The use of hypothesis is frequent—if a workman can lay so much stone in a day, so much will be accomplished in a given period. In this book as in the Farm Book there are examples of the application of principles. These are primarily topical in form. Under aphorisms, observations, facts in husbandry, are seventeen divisions dealing with various phases of farm operations and domestic manufactures which include milling, brewing, nail and textile manufacture. Monticello was much more than a center of farming as we know it today. It was a small world, in a material way, practically sufficient unto itself.

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[1] Wallace, Henry A., *Thomas Jefferson: Farmer, Educator, and Democrat.* An address delivered at Monticello, November 16, 1937, in connection with the 75th anniversary of the establishment of the land-grant college system and the United States Department of Agriculture, p. 1

AGRICULTURAL PHILOSOPHY

Grasping the very stuff of which farming is made—as a scientist in the field, a thinker with world vision—Jefferson visited, swapped seeds and tools, and talked operations with friends and neighbors. Correspondence with his brother, Randolph, a dirt farmer down on the James, deals, in a homely, affectionate way, with gardening operations, sheep dogs, and many other farm matters. Jefferson, foe of primogeniture and entail, was a firm believer in the character and democratic qualities of the small farmer. He distrusted undue emphasis on industrialism as a disease which might destroy democracy, but this did not mean a lack of appreciation of its importance. He believed in an "equilibrium of agriculture, manufactures and commerce."[6] In 1816 he stated, "Manufactures are now as necessary to our independence as to our comfort."[7]

THE AGRICULTURAL LIBRARY

The library has been one of the important elements in the development of scientific agriculture, and today we have great specialized agricultural libraries in the colleges of agriculture, the experiment stations, and the Department of Agriculture at Washington. But the great specialized agricultural library of Jefferson's time was at Monticello. Other libraries may have included more works in English, but Jefferson's collection included Latin, Greek, French, and Italian contributions as well as the standard English works such as those of Bakewell and Young. Side by side in the several classifications are the attendant sciences chemistry, botany, zoölogy, mathematics, physics, and others. The monographs of Parmentier on the potato, Lastyrie on sheep raising, and De la Brosse on fig culture are listed. There are selections on entomology, beekeeping, and soil chemistry. The work of Robert Livingston on sheep and John Taylor of Caroline's *Arator* were on the shelves. Transactions and reports of agricultural and learned societies, including the American Philosophical Society, are included. In the botany section is a very full set of the works of Linnaeus. Jefferson's work in the promotion of agricultural libraries was carried forward in 1820 when a selected reference list on agriculture, prepared by him, was published in the *American Farmer*.

THE WORLD PLANT MIGRATION

Jefferson gained stimulation from the intellectuals whom he met in Europe, but from the agricultural standpoint, the opportunity which his stay gave him to play a part in the great world plant migration is perhaps more important. In this he was one of the many figures from Aristotle to David Fairchild who have served mankind by distributing the fruits of the earth. As an agricultural representative of an agricultural country he was constantly on the lookout for new ideas. In 1787 he wrote "I am never satiated with rambling through the fields and farms, examining the culture and cultivators, with a degree of curiosity which makes some take me to be a fool, and others to be much wiser than I am."[8] He sent seeds, cuttings, and observations on vineyards, the cultivation of fruits, the production of silk, the milling of rice, and the manufacture of flour to his friends at home. In later years he regarded his efforts on behalf of the cultivation of dry rice and the olive to have been particularly worthy of note. His correspondence with the South Carolina Society for Promoting and Improving Agriculture stresses the importance of experimentation in the development of husbandry. If, in a multitude of experiments, he stated, "we make one useful acquisition, it repays our trouble "[9] Such work, at present carried on in the U S Department of Agriculture, Division of Plant Exploration and Introduction, has in the last fifty years contributed much to the development of such economic crops as soybeans, durum wheat, lespedeza, and oranges, and many cold-, drought-, and disease-resistant fruits and field crops

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[6] Lipscomb and Bergh, *op cit* 12: 271. (Letter to John Jay, April 7, 1809.)

[7] Ford, *op cit* 10 10, 1899 (Letter to Benjamin Austin, January 9, 1816.)

[8] Lipscomb and Bergh, *op. cit.* 6. 106. (Letter to Lafayette, April 11, 1787)

AGRICULTURAL RESEARCH AND EXPERIMENTATION

Jefferson's stimulation to agricultural research among members of the American Philosophical Society appears in the minutes of the Society Sometimes the meetings in the early days appear to have been rather small On April 15, 1791, with ten members present, his motion for a select committee, on which he himself ultimately served together with Benjamin Barton, Dr Wistar, and others, was carried This committee was "to collect materials for forming the natural history of the Hessian fly, and the best means for its prevention or destruction "[10] This pest is now combated in Albemarle County by late plantings and rotations. A later example of Jefferson's desire to extend the benefits of agricultural improvements is to be found in connection with his merino sheep In 1810 he proposed to another sheep enthusiast, President Madison, that they distribute their full-blooded males, one to a county throughout the state, a process which would take about seven years, encouraging formation in each county of small societies to maintain and provide rules for the use of the rams.

FARM MANAGEMENT AND OPERATIONS

During the short period following his retirement as Secretary of State, Jefferson threw his energies into farming operations. A summer visitor, Rochefoucauld, describes him superintending the harvest. This description is one of the few real pictures which we have of Jefferson personally engaged in farming operations It is probable, however, that Jefferson's participation in the actual manual tasks of farming was very slight. The size of his estates and the labor situation were such as to call, primarily, for managerial ability This does not mean that he did not work with his hands Apparently he had a basement workshop, and his manager, Edmund Bacon, describes him at work on various models in which he was interested Among agricultural implements these included the seed drill, the hemp brake, and the threshing machine Of the various mechanical improvements which he made, none, it is probable, illustrates Jefferson's ability as a craftsman more clearly than the development of the improved moldboard for a plow

THE MOLDBOARD FOR THE PLOW

The design and working principles of this moldboard which, in Jefferson's words, combine "a theory which may satisfy the learned with a practice intelligible to the most unlettered laborer,"[11] engaged Jefferson's mind from time to time for more than a quarter of a century The moldboard is first mentioned in his Journal in April 1788 Observing the clumsy peasant ox plows along the way to Paris from the Rhine, he sketched a block of wood so cut with wedgelike surfaces, that, in raising and turning the sod, it would combine efficiency with economy of effort on the part of both the plowman and the draft animals Before using the term "least resistence" in his paper, presented here at the American Philosophical Society in May 1798, he read William Emerson, the English mathematician, and consulted with his fellow Society members, the American mathematicians, David Rittenhouse and Robert Patterson, professor of mathematics at the University of Pennsylvania.

Simplicity of construction is a key point of the contribution Improved moldboards had been made by various persons, as Jefferson undoubtedly was well aware, but these were too complicated for the great mass of farmers, who continued, in shaping their implements, to follow methods such as those of the old Saxons. Plows had iron points, but when the moldboard split, the plowman cut out a section of a tree, judged the grain, and adzed it roughly into shape. Sometimes the result was efficient Sometimes it was not. What Jefferson supplied was a simple formula whereby the husbandman could, with two common implements—the saw and the adze—construct a moldboard, which, considering both implements and methods, would operate to the greatest advantage or offer "the least resistence." Modifications of the board made by Jefferson and others subsequently appeared. Thus Valenciennne on the staff of the Paris Museum of Natural History reproduced Jefferson's drawings in perspective, and a diagram of what may be termed the Jefferson-Valenciennne model to fit the French plow appears in the museum's *Annales* for 1802.

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[9] Lipscomb and Bergh, *op cit.* 5 311 (Letter to William Drayton, May 6, 1786)

[10] *Early Proceedings* 22· 193, 1883

[11] *Trans. Am. Philos. Soc.*, o s., 4 320, 1799.

When viewed in perspective from the technical standpoint, as a contribution to the development of agricultural engineering, Jefferson's moldboard represents, I believe, if a line of distinction be drawn, the last great fundamental development in the series of wooden plows, the product of the family farm, rather than the first great development in the series of present-day metal plows. This, together with the fact that in accord with his philosophy of agricultural improvement, as explained to Charles Willson Peale in 1815, he took out no patent, is perhaps the basic reason for small recognition by writers of the machine age of the importance of his effort. From the cultural standpoint Jefferson's description had far-reaching consequences. Its publication in the United States, France, and Great Britain centered attention upon the plow and the necessity for further efforts toward its improvement. The moldboard of the Paris Museum of Natural History was placed among the museum's agricultural exhibits as a study aid in the course of agricultural education. In this the French were, perhaps, a little ahead of the United States, but on July 9, 1805, the Jefferson moldboard was exhibited at a meeting of the Philadelphia Society for the Promotion of Agriculture here in Philosophical Hall of the College of Physicians. After the meeting this moldboard was probably used for practical purposes. That was 138 years ago, and, so far as is known, no Jefferson moldboard, other than the one just made, exists today in any agricultural exhibit either in this country or abroad.

Jefferson in 1798 had written Sir John Sinclair, of the British Board of Agriculture, that he planned to cast his moldboard in iron, but the credit for this practice in the United States goes to others. Jethro Wood, encouraged by Jefferson, produced a moldboard representing significantly in his words, "a sort of plano-curvilinear" figure. Wood's plow, however, worked badly in the heavy western soils, which clung to its pitted surface. Sometimes the large wooden plow was preferred to the metal, until after 1837 when the John Deere plow came into production. One of these plows, made in 1838 from a broken circular saw blade, is now on exhibition at the United States National Museum. In the forties a factory was established in Moline, Illinois, and a few years later the prairie farmers were buying thousands yearly. Bright steel scouring, this plow served to break the plains of the vast area of the Louisiana Purchase, today's food arsenal for freedom-inspired fighting populations throughout the world.

SOIL CONSERVATION AND CONTOUR PLOWING

Down the sides and slopes of the Appalachians and the great Mississippi Basin run each year, in war and peace, the tiny rivulets, silting the waterways and draining away the Nation's resources to the deltas at the rivers' mouths. Nature's work of a thousand years may go in a night. Erosion is a problem as old as civilization. The Romans knew it. The Old World knew it, and Jefferson and his neighbors knew and feared its consequences on the soils of Albemarle. Those who have examined Jefferson's accounts know that in the latter part of his life he was deep in debt. This, it would be difficult to maintain, was a consequence of his inability in any particular field. Rather, it was the result of a combination of circumstances, important among which were the long periods of public service when he had to leave Monticello to the care of managers. Another circumstance was the red soils of his estate which quickly gullied and washed away to the disadvantage of its owner. Thus in 1794 he wrote Washington that a careful examination of his lands had disclosed that "ten years' abandonment of them to the ravages of overseers, has brought on them a degree of degradation far beyond what I had expected."[12] The staples, tobacco and corn, both clean-tilled crops, contributed to both soil washing and soil exhaustion. At this time Jefferson worked out and put into effect a system of rotations employing legumes, concerning which he corresponded at length with John Taylor, of Caroline County. Fifteen years later, on his retirement from the Presidency, he was again free to fight gullies and employ his knowledge of soils by the use of gypsum and contour plowing.

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[12] Lipscomb and Bergh, *op. cit* 9: 287. (Letter to George Washington, May 14, 1794.)

Where Jefferson learned such plowing is not known. Its origins are as old as we have records, and he may have read its description in his library volume of Columella, or seen it practiced on the slopes of Europe. What is important is that his was the first great voice in the United States to urge its practice. Following this practice with the aid of a hillside plow designed by his son-in-law, Thomas Mann Randolph, together with the use of plaster and clover, would, he hoped, again restore the fertility of the soil which once he said was "exceeded by no upland in the State."[13] Jefferson, in this, was one hundred years ahead of his time. When so much good cheap land existed, the difficulties of spreading a conservation message were large. Changing agricultural practices is changing a way of life. Slow and constant long-time pressure is needed. Some of Jefferson's neighbors practiced contour plowing, but despite constant preachment by many leaders it was not widely taken up until recent years. Soil conservation is not the work of the individual. It is a community matter calling for neighborhood help. Since establishment of the Soil Conservation Service in 1935, state laws have provided for 850 soil conservation districts throughout the United States. In and about Albemarle is the Thomas Jefferson Soil Conservation District. Operating on Jeffersonian Democratic principles, the members of such districts formulate their own conservation ordinances in the same way that a town may pass ordinances for its own protection. These soil conservation ordinances have the force and effect of law, and the will of the majority now sets forms of land use and cultivation such as those once practiced by Thomas Jefferson.

Agricultural Societies

A small beginning in neighborly agricultural co-operation occurred in 1817, when Jefferson's friends and neighbors—statesmen, lawyers, and farmers—met together in Charlottesville to form the Albemarle County Agricultural Society. Agricultural societies for mutual aid and study of technical problems go back to the Roman Empire, and in this country the American Philosophical Society and the Philadelphia Society for the Promotion of Agriculture brought forth a great progeny. The Albemarle Society, primarily local, had many objectives as penned by Jefferson. Attention was to be given to production of staples including wheat, tobacco, and hemp, to soil improvement, the care of livestock, the development of farm machinery, and the "destruction of noxious quadrupeds, fowls, insects and reptiles." Jefferson regarded the regular filling out of report forms by members as very important. Both good and bad practices were to be reported, the former for imitation, the latter for avoidance. "The choicest processes, culled from every farm," he believed "would compose a course probably near perfection."[14]

Under the presidency of James Madison and others the society prospered. Thomas Mann Randolph, Jefferson's son-in-law, and Thomas Jefferson Randolph, his grandson, were members. Steps were taken for the establishment of a nursery and a society machinery headquarters. Efforts were made to improve the breed of local livestock, and premiums were offered for crop production and farm implement improvement. While preoccupation with the university made for a singular personal inactivity on Jefferson's part in the affairs of this society, a resolution offered by his fellow conservationist, General Cocke, in 1822, called for the use of $1,000 in the hands of the treasurer to start a fund for the maintenance of a professorship of agriculture at the University of Virginia. In its view that this professorship would "hasten and perpetuate the march of agricultural improvements already so happily commenced,"[15] the society was expressing a deep-lying sentiment of its founding spirit. Many other local societies and organizations drew inspiration from the words and writings of Jefferson, and when, in observance of the 75th anniversary of the establishment of the Land-Grant College System and the United States Department of Agriculture, a wreath, composed of plants produced by genetical science, was placed at Monticello, the societies and farm organizations were represented among those paying homage.

Agricultural Education

For many years Jefferson had urged the teaching of agriculture, coupled with a thorough grounding in the attendant sciences, in institutions of higher learning. In 1803, noting a drift from the land, he wrote David Williams as to the importance of the establishment of a professorship of agriculture in "every" college and university. Young men, he believed, "closing their academical education with this, as the crown of all other sciences, fascinated with its solid charms, and at a time when they are to choose an occupation, instead of crowding the other classes, would return to the farms of their fathers, their own, or those of others, and replenish and invigorate a calling, now languishing under contempt and oppression."[16] In that year, in his first plan for the University of Virginia, he noted agriculture, botany, and chemistry among the subjects to be taught These same subjects are specified to be taught at the university in his draft of a bill for establishing a system of public education, dated 1817. In 1824 an enactment of the Board of Visitors for the organization of the university, Jefferson being present, provided that botany, chemistry, and rural economy should be taught in the school of natural history. In 1826 he wrote the newly appointed professor of natural history, suggesting that rural economy might be taught by "seasonable alliances with the kindred subjects chemistry, botany and zoology."[17] Jefferson's advanced concept of scientific agricultural education was first realized in the West when, in the 1850's, a college of agriculture was established in Michigan, once termed "Cherronesus" by Jefferson in his projected western ordinance. Then in 1862 came the Land-Grant College Act, which made it possible for each state to establish agricultural colleges staffed with competent faculties and specialists in the many sciences recognized as fundamental to the earth's full harvest.

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[13] Ford, *op. cit.* 10 80, 1899. (Letter to Tristam Dalton, May 2, 1817.)

[14] Lipscomb and Bergh, *op cit.* 17 406. (*Cf* Rodney H True (ed.), Albemarle Agricultural Society, Minute Book. *Am Hist Assoc Ann Rept* 1918, 1 264-265, 1921.)

[15] True, *op cit* 208.

The Living Jefferson

During the past week, in this, Thomas Jefferson's bicentenary year, a joint resolution was introduced in Congress providing for the appointment of the National Agricultural Jefferson Bicentenary Committee to carry out, under the general direction of the United States Commission for the Celebration of the Two-Hundredth Anniversary of the Birth of Thomas Jefferson, appropriate exercises and activities in recognition of his services and contributions to the farmers and the agriculture of the Nation. This resolution, after citing Jefferson's services as patriotic statesman and philosopher, author of the Declaration of Independence, citizen of Virginia, and President of the United States, tells of his work as the farmer, the father of scientific agriculture, the conservationist, and the advocate of agricultural education. "As a figure against the background of the soil of the land he loved," and here I am quoting from the resolution, "he stands as a symbol of its values, democracy and freedom, for the preservation of which the American farmers and all connected with the industry of agriculture are now contributing their maximum effort"[18] He remains, as the one of whom the Psalmist sang, "like a tree planted by the rivers of water, that bringeth forth his fruit in his season."[19]

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[16] Lipscomb and Bergh, *op. cit* 10 430 (Letter to David Williams, November 14, 1803.)

[17] Lipscomb and Bergh, *op cit* 16 170. (Letter to John Emmett, May 2, 1826.)

[18] United States Congress, 78th Congress, 1st Session Joint resolution providing for the appointment of a National Agricultural Jefferson Bicentenary Committee to carry out under the general direction of the United States Commission for the Celebration of the Birth of Thomas Jefferson appropriate exercises and activities in recognition of his services and contributions to the farmers and the agriculture of the Nation, April 12, 1943, p 3

[19] Psalms 1 3

THOMAS JEFFERSON AND THE CLASSICS

LOUIS B. WRIGHT

Henry E. Huntington Library and Art Gallery

(Read by Dr. Frank Aydelotte, April 22, 1943)

IN THE history of learning in America, Thomas Jefferson is a transitional figure. He marks the culmination of a great tradition of classical culture, a culture re-discovered in the Renaissance and transmitted with its Renaissance interpretations to fresh soil in colonial Virginia and New England. He also saw the beginning of a new era in which scientific and "practical" subjects would displace the classics and gain the ascendancy in the schools. Indeed, as everyone knows, Jefferson himself was a pioneer in this new era of education, though he would have sat in sackcloth and ashes had he dreamed that one day his beloved Latin and Greek would almost disappear, not only from the university that he created, but from the very consciousness of men throughout the land.[1] Necessary as were the practical subjects which he advocated, he would have regarded the elimination of the classics as an irreparable loss to a republic that depended for survival upon the intelligence of its electorate and the wisdom and integrity of its leaders. The fact was that Jefferson, like the men of the Renaissance, considered the study of Greek and Roman literature as eminently practical preparation for intelligent living. The classics provided, not merely ornament and delight, but useful guidance in the affairs of daily life. The accumulated wisdom of the ancients was particularly valuable in the training of the *aristoi*, the aristocracy of intelligence, to whom Jefferson looked for democratic leadership.

The classical tradition which Jefferson inherited had long exerted a profound influence upon Virginia civilization.[2] From that day in the 1620's when George Sandys, on the banks of the James River, completed his translation of Ovid's *Metamorphoses*, until Jefferson's own time, the literature of Greece and Rome had helped to shape the thinking of Virginia leaders. In the little libraries which seventeenth-century settlers brought with them, works by Greek and Roman writers occupied a prominent place. These books, we can be certain, were not chosen for ostentation, they were considered essential to the reproduction of the kind of civil society that English settlers dreamed of establishing in the wilderness. That society in its main outlines still preserved cultural patterns developed in the sixteenth century when the belief in the civilizing and humanizing value of the classics reached its zenith in England. This Renaissance belief in the wisdom of the ancients became a vital element in the literary interests of the Virginia ruling class.

For example, the second Richard Lee (d. 1714) – ancestor of a famous line—showed such devotion to ancient languages and literature that he kept his notes in Hebrew, Greek, or Latin, and spent every spare hour in his library reading Homer, Virgil, Plutarch, Tacitus, or another of his favorite authors. But Lee was no recluse scholar, or even exceptional in his class. A busy planter who assumed the usual responsibilities of office, he performed his public and private duties conscientiously and still found time for the writers of antiquity. Indeed, in common with others of his generation, he looked upon these authors as sources of moral and political guidance.

Robert Carter (d. 1732)—known because of his pride and wealth as "King" Carter—was as calculating an architect of fortune as colonial Virginia produced and certainly not one to cultivate notions of pedantry, yet he was proud of being a Latinist and was eager to see that his sons were brought up to read and understand the best of Greek and Latin authors. Not content with mere lip service to learning, he wanted his sons to be grounded thoroughly in the ancient languages, after the methods of the great Czech teacher Comenius, for, as Carter observed, "it is not reading a few scraps from the poets and the other classics that makes boys understand the scope and design of authors."

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[1] Anyone who attempts an appraisal of Jefferson's literary interests finds himself indebted to Professor Gilbert Chinard, whose brilliant and penetrating studies have left little new ground to be explored. Particularly useful for the present purpose are *The Literary Bible of Thomas Jefferson: His Commonplace Book of Philosophers and Poets* (Baltimore and Paris, 1928), *The Commonplace Book of Thomas Jefferson: A Repertory of His Ideas on Government* (Baltimore and Paris, 1926), *Thomas Jefferson, the Apostle of Americanism* (Boston, 1929), and "Thomas Jefferson as a Classical Scholar," *The American Scholar* 1: 133–143, 1932. For a collection of material on Jefferson's ideas on education, see Roy J. Honeywell, *The Educational Work of Thomas Jefferson* (Cambridge, 1931).

[2] For a more detailed consideration of this topic see Louis B. Wright, "The Classical Tradition in Colonial Virginia," *Papers of the Bibliographical Society of America* 33: 85–97, 1939; *The First Gentlemen of Virginia* (San Marino, California, 1939), *passim*, and *The Secret Diary of William Byrd of Westover, 1709–1712* (edited in collaboration with Marion Tinling) (Richmond, 1941), introduction.

Throughout a long and busy life as a planter and public official William Byrd of Westover (d. 1744) followed a rigid schedule of reading Greek and Latin writers, with some Hebrew thrown in for discipline. His taste was varied, and his choice of classical authors ranged from Homer to Terence. Byrd's library—the best in America at that time—contained a remarkable collection of Greek and Roman authors in the finest editions then available. In this library, which remained intact at Westover for many years after Byrd's death, Jefferson himself may have read when he was a student at the College of William and Mary.

Other members of the ruling planter class shared the interest in the classics displayed by Richard Lee, Robert Carter, and William Byrd. Although no realistic historian would pretend that these colonials were a race of notable scholars—or even that many were exceptional linguists—it is highly significant that they clung to the old Renaissance belief in the practical value of classical literature and endeavored to provide adequate opportunities for their own edification and the instruction of their children by the collection of books and the employment of classically trained tutors. Even if colonial Virginians sometimes lacked the ability to read Greek and Latin with ease, their libraries were not lacking in translations which revealed the meaning of the philosophers, poets, and historians of antiquity. Colonial libraries, in fact, are noteworthy for the number of their translations, and many a planter who had scantily learned or forgotten his languages could still profit from the morals of Epictetus or the historical parallels in Plutarch.

The accepted belief in the value of Greek and Roman literature determined the course of Thomas Jefferson's education. His father, Peter Jefferson—a man of greater cultivation than some historians have implied—left dying instructions that his son should be given the best classical training available.[3] Already, at the age of nine, the child had begun the study of Latin, Greek, and French under the tutelage of William Douglass, a Scotch clergyman. After his father's death, he spent two years at the school of the Reverend James Maury, "a correct classical scholar," and a little later entered the College of William and Mary where his natural tendency toward classical literature received further stimulation from a learned Scotchman, Dr. William Small, professor of mathematics, who also lectured on ethics, rhetoric, and belles-lettres. Not least of the influences on Jefferson was his close association with the great teacher of law, George Wythe, also noted in the colony as a Greek and Latin scholar. Under such circumstances, a youth with Jefferson's keen and impressionable mind could not have escaped a sound classical training.

In later life, Jefferson frequently expressed his gratitude for the early opportunities of learning the fundamentals of Greek and Latin. Writing to Joseph Priestley in 1800, he remarks:

> To read the Latin and Greek authors in their original is a sublime luxury, and I deem luxury in science to be at least as justifiable as in architecture, painting, gardening, or the other arts. I enjoy Homer in his own language infinitely beyond Pope's translation of him, and both beyond the dull narrative of the same events by Dares Phrygius, and it is an innocent enjoyment. I thank on my knees him who directed my early education for having put into my possession this rich source of delight, and I would not exchange it for anything which I could then have acquired, and have not since acquired.[4]

The literature of antiquity, Jefferson learned as a student, was the ultimate source of both delight and instruction—a precept which George Wythe would have given him if he had not already gleaned it from Horace. But it would be a mistake to assume that the Albemarle youth, like an eighteenth-century type of Browning's grammarian, devoted himself to the past with the zeal of a specialist. The tradition which he had inherited, a tradition developed in the sixteenth century, emphasized a well-rounded education and an amateur standing in a number of useful and ornamental arts. Balance and symmetry were important, and Jefferson, consciously or unconsciously, followed the Renaissance theory of education, which gave him an enormous curiosity about a variety of things and contributed to the development of his many-sided personality. He read Shakespeare, Jonson, Milton, Dryden, and other more recent authors, he gained an easy acquaintance with French which later led him to read Montesquieu and his contemporaries; he found a particular interest in mathematics and natural science, but the literature of Greece and Rome was the core around which all other studies were grouped. From the classics Jefferson believed that he obtained the basis of an ethical and philosophical system as well as the means of satisfying his esthetic longings.

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[3] Henry S. Randall, *The Life of Thomas Jefferson* (New York, 1858) 1: 18.

[4] *The Writings of Thomas Jefferson*, Memorial edition (Washington, 1903), 10: 146–147; January 27, 1800. Unless otherwise stated, citations are to this edition.

The respect for the classics acquired in his youth Jefferson retained throughout his life, but this interest was never merely academic or pedantic. For him the literature of the ancient world had a utilitarian value of the highest importance, a value which he constantly emphasized later in his plans for public schools in Virginia and the foundation of a university. Unlike some scholars who reverence antiquity, Jefferson displayed a common-sense attitude toward classical learning. The battle of the books, which aroused the biased excitement of eighteenth-century protagonists of ancient or modern learning, had no interest for Jefferson. All learning had its proper place, and he was not concerned to elevate one school over another. Both the ancients and the moderns were essential in their particular spheres.

The classics should not always be chosen in preference to modern writings, Jefferson clearly stated on several occasions, pointing out that more recent literature, even imaginative works, might have an equal or superior value. In a letter to Robert Skipwith recommending a certain course of reading, he observes that "the entertainments of fiction are useful as well as pleasant." And he adds a query certain to be made by classical purists "But wherein is its utility, asks the reverend sage, big with the notion that nothing can be useful but the learned lumber of Greek and Roman reading with which his head is stored?" In answer, he shows that imaginative works like *Macbeth* and *King Lear* teach lessons as profound as those in factual history.[5] In another letter of advice, to J. W. Eppes, he remarks that up to the age of sixteen, one's principal study ought to be languages—Latin, Greek, French, and Spanish—and of these, "I think Greek the least useful."[6] Yet he himself regarded the ability to read Greek as one of his most valuable accomplishments. But he was too wise to believe that Greek was for everyone more necessary than a modern language, or some other subject of immediate utility.

The ideas in Jefferson's letters advising his nephew Peter Carr on the choice of studies sound like those of Vittorino da Feltre or another of the humanist educators of the early Renaissance. One finds the same insistence upon the development of the complete man, the necessity of exercise and physical development, the advantages of literary learning—not as an excuse for hermitlike retirement from the world, but as a means of service to the state—and lastly, the practical utility of classical authors as guides and counsellors. To young Carr, Jefferson wrote from Paris on August 19, 1785

> I have long ago digested a plan for you, suited to the circumstances in which you will be placed. This I will detail to you, from time to time, as you advance. For the present, I advise you to begin a course of ancient history, reading everything in the original and not in translations. First read Goldsmith's history of Greece. This will give you a digested view of that field. Then take up ancient history in the detail, reading the following books in the following order. Herodotus, Thucydides, Xenophontis Anabasis, Arrian, Quintus Curtius, Diodorus Siculus, Justin. This shall form the first stage of your historical reading, and is all I need mention to you now. The next will be of Roman history [Note "Livy, Sallust, Caesar, Cicero's epistles, Suetonius, Tacitus, Gibbon."] From that we will come down to modern history. In Greek and Latin poetry, you have read or will read at school, Virgil, Terence, Horace, Anacreon, Theocritus, Homer, Euripides, Sophocles. Read also Milton's *Paradise Lost*, Shakespeare, Ossian, Pope's and Swift's works, in order to form your style in your own language. In morality, read Epictetus, Xenophontis Memorabilia, Plato's Socratic dialogues, Cicero's philosophies, Antoninus, and Seneca. In order to assure a certain progress in this reading, consider what hours you have free from the school and the exercises of the school. Give about two of them, every day, to exercise, for health must not be sacrificed to learning. A strong body makes a mind strong. As to the species of exercise, I advise the gun. While this gives a moderate exercise to the body, it gives boldness, enterprise, and independence

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[5] *Ibid.* 4: 237; August 3, 1771.

[6] *Ibid.* 6: 189–190, July 28, 1787.

> to the mind Games played with the ball, and others of that nature, are too violent for the body and stamp no character on the mind Walking is the best possible exercise [7]

Advice like this would have been understood and approved by Vittorino, or Battista Guarino, or the Elizabethan humanist, Roger Ascham

In this and in other letters to Carr, Jefferson outlines the training necessary to a man destined for public life The backbone of his study must be classical literature, with emphasis upon history, but other subjects are also necessary· the French language, for instance, because the advanced literature of mathematics and science is in that tongue, and Spanish, because the future destiny of the United States lies with the Latin nations to the South [8]

Jefferson's formal proposals for educational reform in Virginia expressed a similar view of the importance of classical learning, though he repeatedly emphasized the necessity of a balanced program of studies, in both the elementary schools and the university [9] Every citizen ought to know something about antiquity, even if all could not learn the languages, Jefferson believed Hence, in his *Bill for the More General Diffusion of Knowledge*, submitted to the House of Delegates in 1779, he suggested reading-books based on Greek, Roman, English, and American history The ancient world was a part of the universal heritage which young Virginians of all classes must be taught to appreciate From the Greeks and Romans the people would learn lessons of history valuable to the preservation of republican liberty

Jefferson's goal in the various schemes of education which he devised was always practical His aim was to provide the type of education most useful in raising the general level of intelligence, assuring adequate leadership, and promoting the public welfare In planning the University of Virginia he constantly emphasized the practical aspects of higher education, showing little sympathy for the pursuit of abstract learning merely for its own sake. But Jefferson's concept of the practical was broad He would have been appalled at the ignorant shortsightedness of present-day theories which assert the same intentions For Jefferson did not confuse education with a smattering of miscellaneous information, or with learning a trade or profession The university should provide the broad base of knowledge needed by an intelligent leader in the state It is significant, therefore, that although Jefferson vastly extended the scope of university education, he insisted upon the retention of adequate instruction in the classical languages and literature [10] These studies, he believed, were useful in the development of wise leadership Naturally he insisted that a purely philological interest in language was of far less importance than an understanding of the substance of classical literature In a letter to Priestley about the proposed University of Virginia, he declared that he did not consider a knowledge of classical languages absolutely essential for eminence in all sciences, "but I think them very useful towards it", and he added the opinion that the Greeks and Romans had left the best "models which exist of fine composition, whether we examine them as works of reason, or of style and fancy, and to them we probably owe these characteristics of modern composition "[11] No man could be educated without a thorough knowledge of history, especially the works of the Greek and Roman historians These authors should be read preferably in the original tongues, but if that was impossible, they must be studied anyway in translation The founder of the University of Virginia intended every citizen trained therein to see his world from the long perspective of the past

Jefferson summarized his views on the place of the classical languages in American education in a letter written to thank John Brazier for a copy of his review of John Pickering's essay on modern Greek pronunciation

> You ask my opinion on the extent to which classical learning should be carried in our country . The utilities we derive from the remains of the Greek and Latin languages are, first, as models of pure taste in writing To these we are certainly indebted for the rational and chaste style of modern composition which so much distinguishes the nations to whom these languages are familiar . . . Second. Among the values of classical learning I estimate the luxury of reading the Greek and Roman authors in all the beauties of their originals. . . . I think myself more indebted to my father for this than for all the other luxuries his cares and affections have placed within my reach; and more now than when

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[7] *Ibid.*, 5 84–85

[8] *Ibid* 6· 256–262, August 10, 1787, 7. 43–44, May 28, 1788

[9] Details of Jefferson's educational theories, with relevant documents, are given in Honeywell, *passim*

[10] *Ibid.*: 10, 113, 123, 284

[11] *Writings* 10 146–147, January 27, 1800.

> younger and more susceptible of delights from other sources. . . . Third. A third value is in the stores of real science deposited and transmitted [to] us in these languages, to wit in history, ethics, arithmetic, geometry, astronomy, natural history, etc.
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> But to whom are these things useful? Certainly not to all men. There are conditions of life to which they must be forever estranged, and there are epochs of life too, after which the endeavor to attain them would be a great misemployment of time. Their acquisition should be the occupation of our early years only, when the memory is susceptible of deep and lasting impressions, and reason and judgment not yet strong enough for abstract speculations. To the moralist they are valuable, because they furnish ethical writings highly and justly esteemed. . . . The lawyer finds in the Latin language the system of civil law most conformable with the principles of justice of any which has ever yet been established among men, and from which much has been incorporated into our own. The physician as good a code of his art as has been given us to this day. . . . The statesman will find in these languages history, politics, mathematics, ethics, eloquence, love of country, to which he must add the sciences of his own day, for which of them should be unknown to him? And all the sciences must recur to the classical languages for the etymon, and sound understanding of their fundamental terms. For the merchant I should not say that the languages are necessary. Ethics, mathematics, geography, political economy, history, seem to constitute the immediate foundation of his calling. The agriculturist needs ethics, mathematics, chemistry, and natural philosophy. The mechanic the same. To them the languages are but ornament and comfort. I know it is often said there have been shining examples of men of great abilities in all the businesses of life, without any other science than what they had gathered from conversations and intercourse with the world. But who can say what these men would not have been, had they started in the science on the shoulders of a Demosthenes or Cicero, of a Locke or Bacon, or a Newton? To sum the whole, therefore, it may truly be said that the classical languages are a solid basis for most, and an ornament to all the sciences.[13]

If Jefferson had merely followed his personal taste, he undoubtedly would have given an even larger place in his educational program to classical studies, for early in life he had come to look upon Greek and Roman literature as an unfailing repository of wisdom, as well as a fountain of delight. The clues to his favorite authors and their influence upon him are revealed in the commonplace book, where, as a young man, he wrote down his favorite passages. Since Professor Gilbert Chinard's edition of this notebook, every student of Jefferson is aware of the preponderance of classical authors in his reading during the formative period of his life. Long passages from Homer, Herodotus, Euripides, Anacreon, Virgil, Cicero, Horace, and Terence, chosen because of the pregnancy of their meaning, he painstakingly copied, against the time when he might wish to refresh his memory. These authors and many others from the ancient world continued throughout the rest of his life to provide enjoyment and food for reflection. His letters, even in the busy years while he was President, reflect his constant reading of classical authors from whom he received refreshment and support.

Although Jefferson read widely and knew the French and English philosophers and historians of his own age, his thinking was chiefly influenced by the writers of antiquity. From the Greek stoics, he gathered the elements of his personal philosophy, and in Latin historians he found confirmation of much of his political theory. Not Montesquieu, not Voltaire, not Bolingbroke, but Homer, Epictetus, Cicero, Tacitus, and other Greeks and Romans supplied him with inspiration and ideas. "By a strange anomaly," Professor Chinard remarks, "the son of the pioneer, the young man supposedly brought up under frontier influence, felt more kinship with Greece and republican Rome than with the philosophers of London, Paris, or Geneva."[15]

Like others educated in the classical tradition of the eighteenth century, Jefferson thought of himself as a Roman in the days of the republic's purity, a sort of Virginian Cincinnatus. Indeed, he often implies the parallel. When he is busiest with affairs of state, his letters express a yearning to return to the simplicity of his farm. When he is at Monticello, he writes in Horatian phrases of the pleasures of country life and the freedom from cares of office. Although he is the last person to be accused of living in the past, he adapted the ideas of antiquity to his own day. Significantly he copied in his notebook a rural idyl from Horace, the Second Epode, leaving out the passages that were inapplicable to a Virginia plantation.[16] In his "edited" version Horace reads like an American pastoral poet writing from an Albemarle hilltop. Long after he copied this passage, Jefferson continued to describe to his friends the pleasures of his simple existence at Monticello, and his own reluctance to take time from Horace and Tacitus, even to read the newspapers.[15]

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[13] *Ibid.* 15: 207-211, August 24, 1819.

[15] Chinard, *Thomas Jefferson* 26.

[16] Chinard, *The Literary Bible* 32-33, 184-187.

Great as was his admiration of the Greeks, Jefferson clearly felt more at home with the Roman historians and moralists. In fact, he placed Tacitus first among the world's writers In a letter to his granddaughter, Anne Cary Bankhead, December 8, 1808, he commends her program of reading

> I like much your choice of books for your winter's reading Middleton's *Life of Cicero* is among the most valuable accounts we have of the period of which he writes, and Tacitus I consider the first writer in the world without a single exception. His book is a compound of history and morality of which we have no other example [16]

Many years later, hearing of the discovery of a great collection of Greek manuscripts in a vault at Athens, he wrote to Joseph Coolidge, Jr · "If true, we may recover what had been lost of Diodorus Siculus, Polybius, and Dion Cassius I would rather, however, it should have been of Livy, Tacitus, and Cicero."[17] That Tacitus with his sententious moralizations on the virtues of republican government should have become Jefferson's favorite author is easy to understand Parallels of political wisdom evident in other Latin historians gave them also a preferred place in his reading.

Cicero he respected and read for moral wisdom, but he disliked his style. No orator himself, Jefferson had a contempt for the windy speeches of politicians, and he particularly disliked the rolling periods of Ciceronian oratory, much affected on the public platform in his time. If Congressmen would read Livy, Tacitus, and Sallust, he declared, they would find models and material more suitable for their purposes than in Cicero's orations In fact, he believed that Ciceronian speeches in Congress would create such public disgust that the governmental power would shift to the executive branch—which apparently was untainted by Cicero. "I observe," he wrote J. W Eppes in 1810,

> that the H[ouse] of R[epresentatives] are sensible of the ill effects of the long speeches in their house on their proceedings But they have a worse effect in the disgust they excite among the people, and the disposition they are producing to transfer their confidence from the legislature to the executive branch, which would soon sap our Constitution. These speeches therefore, are less and less read, and if continued will cease to be read at all The models for that oratory which is to produce the greatest effect by securing the attention of hearers and readers, are to be found in Livy, Tacitus, Sallust, and most assuredly not in Cicero I doubt if there is a man in the world who can now read one of his orations through but as a piece of task-work [18]

Fourteen years later, writing to David Harding, of Hingham, to express his pleasure at having a debating society named after him, Jefferson took occasion once more to commend short and logical speeches

> Antiquity has left us the finest models for imitation, and he who studies and imitates them most nearly will nearest approach the perfection of the art Among these I should consider the speeches of Livy, Sallust, and Tacitus, as pre-eminent specimens of logic, taste, and that sententious brevity which, using not a word to spare, leaves not a moment for inattention to the hearer Amplification is the vice of modern oratory It is an insult to an assembly of reasonable men, disgusting and revolting instead of persuading Speeches measured by the hour, die with the hour [19]

These statements are revealing as evidence of the qualities that Jefferson prized in writers as well as in public orators Substance, not ornaments and tricks of style, pleased him most.

Jefferson's ethical views were a fusion of classical and Christian ideals, a synthesis of the best that he could extract from Epictetus, Epicurus, and Jesus. Concerning his religion he was usually reticent, but in letters to a few friends—notably Joseph Priestley, Benjamin Rush, William Short, and John Adams—he expounded his opinions in considerable detail. One letter to Short, written in 1819, should be read in full for the insight it gives of Jefferson's ethics and the sources of his ideas. A few sentences will suggest the writer's point of view.

> As you say of yourself, I too am an Epicurean I consider the genuine (not the imputed) doctrines

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[15] *Writings* 12· 437, letter to David Howell, December 15, 1810. The same idea is repeated in a letter to Charles Pinckney, February 2, 1812 (*Jefferson Papers*, Massachusetts Historical Society Collections, 7th ser. 1: 169, 1900). In a letter to John Adams, January 21, 1812, Jefferson says he has given up newspapers in exchange for Tacitus and Thucydides (*Writings* 13. 124)

[16] *Jefferson Papers:* 128–129.

[17] *Writings* 18: 336–337; January 15, 1825

[18] *Ibid.* 12 343, January 17, 1810

[19] *Ibid.* 16: 30–31; April 20, 1824.

> of Epicurus as containing everything rational in moral philosophy which Greece and Rome have left us. Epictetus, indeed, has given us what was good of the Stoics, all beyond, of their dogmas, being hypocrisy and grimace. Their great crime was in their calumnies of Epicurus and misrepresentations of his doctrines; in which we lament to see the candid character of Cicero engaging as an accomplice. Diffuse, vapid, rhetorical, but enchanting. His prototype Plato, eloquent as himself, dealing out mysticisms incomprehensible to the human mind, has been deified by certain sects usurping the name of Christians, because, in his foggy conceptions, they found a basis of impenetrable darkness whereon to rear fabrications as delirious, of their own invention. . . . Of Socrates we have nothing genuine but in the Memorabilia of Xenophon, for Plato makes him one of his collocutors merely to cover his own whimsies under the mantle of his name, a liberty of which we are told Socrates himself complained. Seneca is indeed a fine moralist, disfiguring his work at times with some Stoicisms, and affecting too much of antithesis and point, yet giving us on the whole a great deal of sound and practical morality. But the greatest of all reformers of the depraved religion of His own country was Jesus of Nazareth. . . . Epictetus and Epicurus give laws for governing ourselves, Jesus a supplement of the duties and charities we owe to others.[20]

Appended to this letter is a syllabus of the doctrines of Epicurus. An outline of the philosophy of Jesus was omitted because it was "too long to be copied." Ten years before, in a letter to Benjamin Rush,[21] Jefferson had included a syllabus of Jesus' teachings. That outline, and his anthology from the New Testament, which he called *The Life and Morals of Jesus*, indicate the way in which he harmonized the rationalism of Epicurus and the rational portions of Christian doctrine.

Being a practical rationalist, Jefferson never comprehended the mystical concepts of Plato, and he usually spoke of the philosopher with contempt. Indeed, in another letter to Short, he declared that "no writer, ancient or modern, has bewildered the world with more *ignis fatui* than this renowned philosopher, in ethics, in politics, and physics." Upon Plato Jefferson blamed the contradictions in the character of Socrates. Since all antiquity testified to the wisdom of Socrates, Jefferson excused his apparent sophisms and puerilities as "the whimsies of Plato's own foggy brain."[22] Likewise, he attributed to "Platonizing Christians" the confusion and misinterpretation of the simple teachings of Jesus.[23]

If Jefferson was blind to the metaphor and mysticism of Plato, it must not be assumed that he was devoid of literary appreciation. Although purely ethical and utilitarian values largely determined his choice of authors, he read both prose and poetry with delight. Writing in his late fifties, he confessed to a lessening interest in poetry—as an excuse for failing to apprehend the beauties of Joel Barlow's *Columbiad*—and he had observed in his *Thoughts on English Prosody* (written shortly after 1789) that "as we advance in life . . . I suspect we are left at last with only Homer and Virgil, perhaps with Homer alone."[24] Actually, however, Jefferson continued to read both Greek and Latin poetry until the end of his life, as his letters prove, especially the remarkable correspondence with John Adams in which the two old men discussed everything from a theory of the Trojan origin of the Indians to the relative merits of the pastorals of Theocritus and David.[25] In his youth, he had found particular pleasure in Homer, Euripides, Anacreon, and Horace. His taste for these poets endured. When, bowed down with grief, he sought an appropriate epitaph for his wife, he chose two lines from the *Iliad*, and when he came to write the final directions for his own burial, he began the note with a quotation from Anacreon on the evanescence of man.

Although classical poetry made a deep impression upon Jefferson, he continued to find his most satisfying reading in the prose of the historians and moralists. Some of them, notably Tacitus, he constantly reread. In these writers he could not help seeing parallels to contemporary affairs. A letter to John Adams in 1819 begins with a paragraph on the ominous threat of the Missouri agitation and continues with a long discussion of the Romans. "I have been amusing myself latterly with reading the voluminous letters of Cicero," he reports.

> They certainly breathe the purest effusions of an exalted patriot, while the parricide Caesar is lost in odious contrast. . . . Your intimacy with their history, ancient, middle, and modern, your familiarity with the improvements in the science of government

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[20] *Ibid.* 15. 219–220, October 19, 1819.

[21] *Ibid.* 10: 379–385, April 21, 1803.

[22] *Ibid.* 15: 258; August 4, 1820.

[23] *Ibid.* 15: 383, letter to Benjamin Waterhouse, June 26, 1822.

[24] Chinard, *The Literary Bible*, 27–28.

[25] *Writings* 13: 246–249, 279–284, 387–394.

> at this time, will enable you, if anybody, to go back with your principles and opinions to the times of Cicero, Cato, and Brutus, and tell us by what process these great and virtuous men could have led so unenlightened and vitiated a people into freedom and good government, *et eris mihi magnus Apollo Cura ut valeas et tibi persuadeas carissimum te mihi esse*[26]

Scores of similar observations in his letters indicate Jefferson's pleasure in reading classical history and his persistent belief in the value of its lessons

We should not assume, however, that Jefferson had any sentimental illusions about the infallibility of the ancients Concerning the practical utility of Aristotle's *Politics*, for example, he wrote some sound advice to Isaac H Tiffany

> So different was the style of society then, and with those people, from what it is now and with us, that I think little edification can be obtained from their writings on the subject of government They had just ideas of the value of personal liberty, but none at all of the structure of government best calculated to preserve it The introduction of this new principle of representative democracy has rendered useless almost everything written before on the structure of government, and, in a great measure, relieves our regret, if the political writings of Aristotle, or of any other ancient, have been lost, or are unfaithfully rendered or explained to us[27]

Jefferson was opposed to the literal acceptance and application of political axioms on the authority of Aristotle or any other writer of antiquity, on the other hand, he advised making use of the experience, observations, suggestions, and general wisdom to be gleaned from the sages of earlier periods

Too utilitarian in purpose ever to become a pedant, Jefferson nevertheless understood the pleasures of philological inquiry One suspects that he sometimes had to reason with himself to restrain purely philological and antiquarian impulses A man with sufficient interest in language to compile a usable Anglo-Saxon grammar would naturally not be blind to classical philology A long letter to Edward Everett in 1823 thanks him for a copy of Buttman's *Greek Grammar* and remarks that the author "goes with the herd of grammarians in denying an ablative case to the Greek language I cannot concur with him in that"[28] And Jefferson proceeds to argue for an ablative in Greek After a discussion with Adams about the soundness of the Latin word *gloriola*, he observes "Your doubt of the legitimacy of the word *gloriola* is resolved by Cicero, who, in his letter to Lucceius expresses a wish '*ut nos metipsi vivi gloriola nostra perfruamur*'"[29]

But of all problems in classical philology, Jefferson was most interested in the recovery of the original pronunciation of the Greek and Latin tongues Writing to Ezra Stiles from Paris in 1785 concerning the war in Europe, he observes "We should wish success to the object of the two empires if they meant to leave the country in possession of the Greek inhabitants We might then expect, once more, to see the language of Homer and Demosthenes a living language For I am persuaded the modern Greek would easily get back to its classical models"[30] Two years later, in a letter to George Wythe, he remarks "I cannot help looking forward to the re-establishing of the Greeks as a people, and the language of Homer becoming again a living language, as among possible events"[31] Interest in Greek liberty—with Jefferson as with many another intellectual of the nineteenth century was prompted to a considerable degree by love of Homer's language Jefferson retained an interest in the re-establishment of classical Greek as a living language and was greatly interested in the comparison between modern and classical Greek pronunciation

Likewise he was eager for American schoolmasters to adopt the Continental pronunciation of Latin because it was nearer to the original sound The English style of Latin pronunciation, customary in New England, was an offense to his ears In a letter to William B Giles in 1825 he laments the low state of Latin scholarship at the University of Virginia and describes the horrors of a pronunciation imported from Connecticut

> We were obliged last year to receive shameful Latinists into the classical school of the University, such as we will certainly refuse as soon as we can get from better schools a sufficiency of those properly instructed to form a class. We must get rid of this Connecticut Latin, of this barbarous confusion of

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[26] *Ibid* 15, 232-235, December 10, 1819

[27] *Ibid* 15: 65-66; August 26, 1816.

[28] *Ibid* 15 410-415, February 24, 1823 See another letter to Everett, March 27, 1824 (*Writings* 16: 20-22)

[29] *Ibid* 15: 333-335, September 12, 1821

[30] *Ibid* 5 35-39; July 17, 1785 *Cf* also pp 89-90.

[31] *Ibid.* 6 296-301; September 16, 1787.

long and short syllables, which renders doubtful whether we are listening to a reader of Cherokee, Shawnee, Iroquois, or what [22]

Jefferson had a genuine interest in language and could appreciate subtle variations of idiom and style in Greek and Latin authors From the classics he drew arguments to combat the authority of grammatical purists, particularly misguided sticklers for rules who insisted that the American language must remain in bondage to the vocabulary and pronunciation of the British Isles A grammarian of a more liberal view received his commendation "I concur entirely with you in opposition to purists who would destroy all strength and beauty of style by subjecting it to a rigorous compliance with their rules Fill up all the ellipses and syllepses of Tacitus, Sallust, Livy, etc , and the elegance and force of their sententious brevity are extinguished "[23] He points out that the Athenians did not consider the Greek language disfigured by Doric, Ionian, and other dialects, but on the contrary were aware that the language was enriched by them In a similar way, the English language will receive enrichment from American dialects

Problems of textual scholarship excited Jefferson's interest in his later years, and, through the youthful George Ticknor, he learned to admire the scientific school of textual criticism developing in Germany in the early nineteenth century [24] In February, 1815, about two months before Ticknor sailed for Germany, he visited Jefferson at Monticello. For three days the aging statesman and the enthusiastic student discussed literature and learning, and when Ticknor left he was commissioned by Jefferson to purchase a collection of the best European editions of Greek and Roman authors, needed at Monticello to replace books sold to the Library of Congress In addition to critical editions, Jefferson wanted scholarly translations for the light they threw on the meaning of obscure passages In a letter of instructions to Ticknor, after remarking on the corrupt text of Cicero's philosophical works, he adds "Translations aid us with the conjectures of those who have made it a particular business to study its text " In another letter, after urging Ticknor to avoid unwieldly folios and quartos in favor of convenient octavos, he mentions the kind of texts most desired "I value explanatory notes, but verbal criticisms and various readings not much I am attracted to the scholia of the Greek classics because they give us the language of another age, and with the Greek classics prefer translations as convenient aids to the understanding of the author "[25] In the summer of 1815, Ticknor shipped some of the best editions available in Göttingen Homer and Virgil by Christian Gottlob Heyne, Aeschylus by Christian Gottfried Schütz, Juvenal by Georg Alexander Ruperti, and Tacitus by Jérémie Jacques Oberlin Jefferson was delighted with the quality of the textual scholarship and wrote enthusiastically to his friend and agent

> The editions of Heyne, Ruperti, Oberlin, are indeed of the first order, but especially Heyne's of the *Iliad* It exceeds anything I had ever conceived in editorial merit How much it makes us wish he had done the same with the Odyssey This style of editing has all the superiority your former letters have ascribed to it, and urges us to read again the authors we have formerly read to obtain a new and higher understanding of them [26]

In an outburst of renewed zeal for classical studies the sage of Monticello wrote Ticknor's father that if he were twenty years younger he would join the youth upon a journey to Rome and Athens

When the British burned the Library of Congress in 1814, Jefferson sold to the nation his own magnificent collection of books for half their cost Immediately he set about gathering a new library for himself Thanks in part to Ticknor's help, the library at Monticello soon contained some of the best critical texts of the classics then available in Europe [27] Not even the straitened state of Jefferson's finances prevented the buying of fine editions of his favorite authors.

The most obvious proof of Jefferson's debt to the classical world is to be seen, of course, in the architectural monuments which he left as memorials to the diversity of his talents Architecture was something more than a hobby with him, and he applied himself to the art with singular devotion. During his travels in France he was fascinated with the remains of Roman architecture, particularly the Maison Carrée at Nîmes, which he chose as the principal model for the state capitol at Richmond In a letter of September 20, 1785, to James Madison, he described the Maison Carrée as "one of the most beautiful, if not the most beautiful and precious morsel of architecture left us by antiquity," and he implored Madison to try to delay work on the capitol until the model being prepared in France could reach Richmond Already he dreamed of setting up a standard of esthetic judgment based on classical examples "How," he asked Madison, "is a taste in this beautiful art to be formed in our countrymen unless we avail ourselves of every occasion when public buildings are to be erected, of presenting to them models for their study and imitation?"[38] During the next thirty years, Jefferson labored unceasingly over his drawing board to provide the plans and diagrams of both public buildings and private residences, chastely classical in conception, to be examples for his countrymen's "study and imitation" The Virginia capitol, the Rotunda and the pavilions of the University of Virginia, Monticello, and many other structures demonstrate his ability to translate a belief in the superiority of the Roman style into tangible illustrations of his theory

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[22] *Ibid* 16 146-151, December 26, 1825

[23] *Ibid* 13 338-347, letter to John Waldo, August 16, 1813

[24] For a discussion of this episode in Jefferson's career, see O. W Long, *Thomas Jefferson and George Ticknor A Chapter in American Scholarship* (Williamstown, Mass , 1933).

[25] *Ibid* 16

[26] *Ibid* 20

[27] Books in the second library collected at Monticello are listed in a *Catalogue President Jefferson's Library by Nathaniel P Poor*, published by Gales and Seaton in Washington for the sale on February 27, 1829 The books in Jefferson's earlier and larger collection, sold to the nation after the Library of Congress burned in 1814, are listed in a *Catalogue of the Library of the United States* (Washington, 1815) Both catalogues show excellent collections of the classics.

Jefferson learned architectural design chiefly in his library, where he had a collection of the best books on the subject, though his travels in Europe also strengthened his esthetic judgment and sharpened his perceptions. In his study he pored over the designs of Vitruvius and the Roman's great Renaissance disciple Palladio For the English imitations of Palladio, he had scant respect, but from French eighteenth-century interpretations of classical design he gained a certain inspiration.[39] From Palladio directly, however, came most of his own basic designs, which he adapted with remarkable ingenuity to the practical requirements of Virginia buildings, public and private. In architecture, as in history and literature, he took from the classics everything that was useful and adapted it to his own ends without becoming a slave to convention Such skill of adaptation and creation could not have been shown by even an inspired dilettante, it was proof of painstaking and studious application to his art, an art which the best critic of Jefferson's architectural ability describes as the fusion "of retrospection and of science," and "above all, a critical historic spirit "[40]

To American architecture he brought mathematical precision of line and correctness of detail based on the finest examples of Roman building In the words of Fiske Kimball, "directly or indirectly, American classicism traces its ancestry to Jefferson, who may truly be called the father of our national architecture."[41] The modernistic critics who complained recently about the "outmoded classical style" of the Jefferson Memorial in Washington surely knew nothing of architectural history To have erected in Jefferson's honor a structure in other than the Roman style would have been a supreme irony

Thoroughly saturated in the literature and history of antiquity, Jefferson thought of the Greeks and Romans not as abstractions in books but as part of the organic stream of life The personalities of Greece and Rome were almost as familiar as those of his own country When Patrick Henry addressed the House of Delegates, Jefferson observed that the orator spoke "as old Homer wrote" When Jefferson's mind dwelled on ambitious dictators, he recalled Julius Caesar before he remembered Napoleon. When traitors were mentioned, he cited Catiline instead of Benedict Arnold Speaking in admiration of his old friend George Wythe, he described him as "a Cato without the avarice of the Roman" Such references, of course, were conventional among educated men in this period, but Jefferson was remarkable for the way in which he assimilated the classical past into his own idiom His language and his thought were singularly free from academic taint and bookishness. Only in a few instances—a very few—did his learning betray him into pedantry, as when he invented Grecian names for new states and territories—Cherronesus, Assenisipia, Illinoia, Polypotamia, Metropotamia, and Pelisipia[42] Happily, this suggestion, more reminiscent of Shakespeare's

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[38] *Writings* 5: 134–137 *Cf* also the letter to the Comtesse de Tessé, March 20, 1787 (*Writings* 6: 102–106).

[39] Fiske Kimball, *Thomas Jefferson, Architect* (Boston, 1916): 37, 81, 82.

[40] *Ibid.*: 83.

[41] *Ibid.*: 89.

[42] *The Writings of Thomas Jefferson*, collected and edited by Paul Leicester Ford (New York, 1898), 3: 410.

Holofernes than the Virginian, was overruled, and it stands as the rare exception to the usual ease with which Jefferson wore his classical learning

The most significant quality of Jefferson's classicism, in its various manifestations, was its vitality, the fact that it was a living thing, a part of everyday life. He himself wisely advised against "the Gothic idea that we are to look backwards instead of forward for the improvement of the human mind,"[43] but he was conscious of being the heir of all the past. Systematically and intelligently, he investigated the true worth of that heritage and pointed out its utility to his own age and generation His interpretation of classical culture carried with it no smell of the lamp, no atmosphere of musty books. Classical studies in America died only when they passed into the exclusive guardianship of the schoolmasters—when shibboleths and tags of language were substituted for the substance of the ancient civilizations In the early years of the republic, the classics had not yet foundered on the arid shores of pedantry.

Jefferson and the men of learning contemporary with him still drew on classical sources for inspiration and instruction They still believed that leaders in a democratic state had an obligation to be informed--and if possible, to be wise Education meant something more than the cachet of an academic degree or technical training for a vocation Special fields of human relations —the "social sciences," for example—had not yet invented a jargon unintelligible to ordinary mortals Clarity of thought and expression and breadth of vision were still ideals to be sought, and in the attainment of these ideals, the literature of antiquity had a value unsurpassed In his own person Thomas Jefferson exemplified the universal worth of classical cultivation—a cultivation which helps to explain the wisdom and the vision, not only of Jefferson, but of many others among that remarkable group of leaders who had the intelligence and the character which could create a nation

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[43] *Writings*, Memorial edition, 10. 148, letter to Joseph Priestley, January 27, 1800.

NOTES ON THOMAS JEFFERSON AS A NATURAL PHILOSOPHER

HARLOW SHAPLEY

Harvard College Observatory

(Read April 22, 1943)

1. By this time my colleagues in the symposium have said so much about Thomas Jefferson, and said it so gracefully, that I would do well to abbreviate my remarks. Moreover, the previous speakers have readily encroached upon my subject, doubtless finding it difficult to consider the versatile Jefferson as a lawyer, a farmer, a diplomat, a traveller, without discussing also his thoughts and acts in the broad field of natural philosophy. Thus the famous contribution on the mould-board of the plow has been presented, as well as the observations and speculations on climate, ethnology, and paleontology. My remarks can therefore be in the nature of miscellaneous supplementary notes.

2. Jefferson had a telescope. He was keenly and practically interested in surveying and navigating, and in the astronomical measurements required by such work, but he was in no sense an astronomer. His curiosity about the nonterrestrial was, however, healthy, and his admiration for the famous self-taught David Rittenhouse of Philadelphia brought him into frequent contact with practical and speculative astronomical questions. He used his telescope on the annular eclipse of the sun of September 17, 1811, and reported his observations both carefully and modestly. Toward the end of his life he used the telescope to watch, from his mountain home, the workmen building the University of Virginia.

3. Like all daring thinkers and workers in the pioneer days of so many of the sciences, Jefferson went off the deep end a few times. These misadventures were so few, compared with his successes, that one should not mention them at all except to counteract the impression that he was actually omniscient and infallible. Naturally he became cautious. When, for example, spectacular reports were made about shooting stars, he was skeptical. According to the Honorable S. L. Mitchill's account, Jefferson declined to accept the story of the meteoritic fall in Connecticut in December, 1807. He did not like this Connecticut story. And he did not like the way the Connecticut Yankees pronounced their Latin, either. There was, indeed, no love lost, for it is notorious how vigorously much of Connecticut disliked this Virginia advocate of religious tolerance. The reported showers of stones from the Connecticut clouds—he discounted such claims at once and said, according to Mitchill, that five words would be sufficient for a response. They were short words—"It is all a lie!"

But later, when the evidence concerning the meteoritic fall became clearer, Jefferson reconsidered the matter and recommended that competent authorities of the American Philosophical Society might look into it. He first pointed out, however, that the sending of the Connecticut stones to the Congressmen was not necessarily the most profitable procedure, in view of the limitations of those particular gentlemen. The letter on the meteoritic stones to Mr. Daniel Salmon is dated February 15, 1808, and is worth quoting as an illustration of Jefferson's scientific attitude.

> Sir,—I have duly received your letter of the 8th instant, on the subject of the stone in your possession, supposed meteoric. Its descent from the atmosphere presents so much difficulty as to require careful examination. But I do not know that the most effectual examination could be made by the members of the National Legislature, to whom you have thought of exhibiting it. Some fragments of these stones have been already handed about among them. But those most highly qualified for acting in *their* stations are not necessarily supposed most *familiar* with subjects of natural history, and such of them as have that familiarity, are not in situations here to make the investigation. I should think that an inquiry by some one of our scientific societies, as the Philosophical Society of Philadelphia for example, would be most likely to be directed with such caution and knowledge of the subject, as would inspire a general confidence. We certainly are not to deny whatever we cannot account for. A thousand phenomena present themselves daily which we cannot explain, but where facts are suggested, bearing no analogy with the laws of nature as yet known to us, their verity needs proofs proportioned to their difficulty. A cautious mind will

> weigh well the opposition of the phenomenon to everything hitherto observed, the strength of the testimony by which it is supported, and the errors and misconceptions to which even our senses are liable It may be very difficult to explain how the stone you possess came into the position in which it was found But is it easier to explain how it got into the clouds from whence it is supposed to have fallen? The actual fact however is the thing to be established, and this I hope will be done by those whose situations and qualifications enable them to do it

4 Much earlier than the years of the meteor shower and the annular eclipse, Jefferson had developed a considerable interest in certain problems of cosmogony During his long stay in France he had become acquainted with many of the leading scientists Among them was the famous Buffon, the great naturalist and the encyclopedic writer on scientific subjects Buffon got some of his biological specimens from Jefferson, and was generous enough to write, "I should have counseled you, sir, before publishing my Natural History, and then I should have been sure of the facts" It was a fine compliment, in the Parisian style It is scarcely imaginable now that a scientist would seek the advice of a leading national politician in order to get his facts straight

5. The "Epoques de la Nature," written by Buffon about 1780, received excited attention throughout Europe It was but one part of the *Histoire Naturelle*, with which he was associated and which appeared during forty years in almost numberless volumes One particular theory in "Epoques de la Nature" disturbed Jefferson He wrote about it, on January 1, 1784, to the Reverend James Madison

> It has occasioned me to reflect a little more attentively on Buffon's central heat than I did in the moment of our conversation and to form an opinion different from what I then expressed The term "central heat" does of itself give us a false idea of Buffon's hypothesis If it means a heat lodged in the center of the earth and diffusing its warmth from thence to the extremities, then certainly it would be less in proportion to the distance from that center, & of course less under the equator than the poles, on high mountains than in deep vallies. But Buffon's theory is that this earth was once in a stage of hot fusion, and that it has been, and still continues to be cooling What is the course of this process? a heated body being surrounded by a colder one whether solid or fluid, the heat, which is itself a fluid flows into the colder body equally from every point of the hotter

Jefferson of course subscribed to the current fluid theory of heat, universal at that time, but it is noteworthy that he also states one of the basic laws of thermodynamics He goes on in the letter to Madison to reason that on the Buffon hypothesis the Earth should be hotter at the Poles than at the Equator, contrary to observation, and contrary to the conclusion derived by Buffon, who says, that the Earth being thinnest at the Poles, will cool sooner there than under the Equator where it is thicker Jefferson concludes, "If my idea of the process of cooling be right, his is wrong and his whole theory in the Epochs of Nature is overset"

6 In general, the natural philosophy of Jeferson was of the practical sort Apparently he was somewhat soured by the speculators on the origin and age of the Earth But he rather skilfully avoided the controversy of his time as to the origin of fossil shells on the mountain tops He would not commit himself that they were remnants of the sea line of the time of Noah's Flood, or evidence of the rising ocean waters having covered the peaks, or one of those strange manifestations of the All-wise which permits shell-like formations to grow through the ages in the same way that queer rock formations and crystals are formed without associated organisms

His interest in geology was chiefly confined to a practical interest in mining and in the related field of paleontology His enthusiasm for fossil bones led him to the inquiries and writings and collecting that have given him right to the title of Founder of American Paleontology As has been told fully elsewhere, and many times, he brought along to the scientists and museums of Philadelphia a collection of remarkable bones when he journeyed to that city to become the Vice President of the United States One hundred and fifty years later those fossils are on proud display Another collection of fossils was assembled for his Monticello museum It was a truly remarkable display for its time In 1816 it dominated the house, according to the account of the French visitor Montlezun, whose detailed report on Monticello, printed in 1818, will soon be re-published by Professor Chinard

7 The steam engine was one of the practical scientific developments of his time that had a peculiar appeal to Jefferson It inspired him to

seek the possibility not so much of transportation nor of manufacturing, but rather of the emancipation of the individual citizen from the drudgery of chores. He viewed the advances of science in terms of the practical problems of his plantation If the tea kettle could only be developed into a practical steam boiler, the water could be pumped to the tops of the houses, the household machinery could then be operated by water power, and hands released from household work for the fields. Jefferson went from France to England especially to see Watt and his famous engine, but the canny inventor, or his advisers, saw to it that this shrewd and inventive Virginian did not get a close look at the details

8. Jefferson was interested in the precious metals from two standpoints—the coinage of the United States, and the mining industry. While Vice President he was attracted by the problems of the copper mines at Newark, New Jersey. Miss Adams has just this month published from the Boston Public Library a letter, heretofore unpublished, touching on this subject. Jefferson wrote to Elisha Boudinot in Newark concerning the resources of the Schuyler copper mines, which operated some three miles north of the town from 1719 to 1775, and later. There is one sentence in that newly published letter which indicates an early contact of the Roosevelt family with the White House Was it prophetic? The sentence is "As soon as you receive Mr Roosevelt's answer I shall be further thankful for the communication of it." A matter of incorporation was involved, and one may assume that the awaited answer came in good time from Nicholas Roosevelt, who was the great-great-granduncle of some later tenants of the White House

9. When in 1790 George Washington was President and Thomas Jefferson the Secretary of State, the latter was asked to make a report on weights and measures, suitable for the new Federation of States The subject naturally interested one with such wide scientific and social interests as Jefferson, and one who had had close contacts with the reforms and innovations in France He made recommendations that in a way resulted in the founding of the Bureau of Standards. But Congress made painfully slow progress with the project.

More than twenty years later Jefferson was writing to Dr. Robert Patterson concerning the effort of the American Philosophical Society to look into the subject of fixing standards of measures, weights, and coins. He was a non-resident member of a committee charged with examining the problem With a fine sense of the disadvantage of working with a committee from a distance, Jefferson modestly remarked, in the introduction to a long letter on the subject

> Isolated as is my position, I am sure I can offer nothing but what occurred to the committee engaged on it, with the advantage on their part of correction by an interchange of sentiments and observations among themselves I will, however, hazard some general ideas, because you desire it, and if a single one be useful, the labor will not be lost.

It is of interest that a major part of this letter is devoted to the question of the appropriate diplomatic techniques necessary to get co-operation in Europe on an American innovation. All must be handled delicately, with full consideration of the prides and prejudices and sensitive vanities of the Governments of the foreign nations

> With England, our explanations will be much more delicate [he is writing about the possibility of international agreement on a decimal system for weights and measures]; they are the elder country, the mother country, more advanced in the arts and sciences, possessing more wealth and leisure for their improvement, and animated by a pride more than laudable. The subject should therefore be opened to them with infinite tenderness and respect, and in some way which might give them due place

His approach reminds one of the techniques and tendernesses necessary at the present time in advocating international fellowship

Jefferson makes an interesting commentary on the English gentleman as an amateur scientist

> We [in Virginia] are all occupied in industrious pursuits. They abound with persons living on the industry of their fathers, on the earnings of their fellow-citizens, given away by their rulers as pensions. Some of these, desirous of laudable distinction, devote their time and means to the pursuits of science, and become profitable members of society by industry of a higher order. (*Writings*, Lipscomb and Bergh ed , 13: 105, 1907)

Coming back to his consideration of weights and measures, we find Jefferson proposing to Dr. Patterson, in one crystal-clear sentence, unmatched in my experience for simplicity and completeness, the following.

> That our unit of measure then be a pendulum of such length as in the latitude of 45°, in the level of the ocean, and in a given temperature, shall perform its vibrations, in small and equal arcs, in one second of time

His uncommon gift for clear writing could not be better illustrated But his proposal was not accepted. His arguments against the unit of the one-ten-millionth part of the distance from the Pole to the Equator were good and to the point But it takes more than clarity and logic to simplify the deeply rooted system of weights and measures.

10. Jefferson's *Notes on Virginia* were among his most noteworthy writings To me they demonstrate more clearly than anything else that, if he had been free from his national political life, he could have readily developed into one of the leading scientists of his time and country. His *Notes on Virginia* touched all phases of the natural history of the region, and dealt with its people and its government. There were many editions, many translations. But he viewed his accomplishments with modesty On September 25, 1785, he wrote to Francis Hopkinson

> I have sometimes thought of sending a copy of my Notes to the Philosophical Society as a tribute to them, but this would seem as if I considered them as worth something, which I am conscious they are not I will not ask you for your advice on this occasion, because it is one of those on which no man is authorized to ask a sincere opinion I shall therefore refer it to further thought

How many an editor has wished that his scientific contributors would refer their compositions to further thought!

The *Notes* were written in the war years, 1781 and 1782, and therefore we should make some allowance for Jefferson's rather stinging comparison of *little* America with Great Britain and great France, so far as the production of genius is concerned His wartime comments on Britain

> The present war so long having cut off communication with Great Britain, we are not able to make a fair estimate of the state of science in that country The spirit with which she wages war, is the only sample before our eyes, and that does not seem the legitimate offspring either of science or of civilization. The sun of her glory is fast descending to the horizon. Her philosophy has crossed the Channel, her freedom the Atlantic, and herself seems passing to that awful dissolution whose issue is not given human foresight to scan

For four hundred years worried men have predicted the impending dissolution of England. She has always been in a state of rapid decline!

11 One could continue at length with quotations that show the sensitiveness, the vast learning, the curiosity, and the originality of this astonishing Virginia farmer He had, as they say, pretty nearly everything In the field of natural philosophy he had caution and daring, inquisitiveness and a willingness to change his mind in the light of new facts or as a result of further thought What we would now call proper scientific methods and attitudes appeared to be instinctive with him

12. His scientific creed is illustrated in his response to the Abbé Raynal's taunt, already mentioned by Professor Chinard, that America had produced no poet, no mathematician, no man of genius in any art or any science In his *Notes on Virginia*, Jefferson asked for time with regard to the poet, but pointed to Washington and Franklin (as well he might) as leaders in the soldier's craft and the craft of physics, and concerning the Philadelphia astronomer he wrote

> We had supposed Mr Rittenhouse second to no astronomer living, but in genius he must be the first, because he is self-taught As an artist he has exhibited as great a proof of mechanical genius as the world has ever produced He has not indeed made a world, but he has by imitation approached nearer its Maker than any man who has lived from the Creation to this day

In a footnote he points out that the European nations traverse the globe with the aid of Hadley's quadrant, which was actually invented by the American Godfrey

But to return to the scientific creed The Abbé Raynal later withdrew his taunt with regard to the North Americans, but still disparaged the South Americans. In a footnote Jefferson questions the sufficiency of the Frenchman's knowledge and the depth of his research on the subject concerning which he was writing. He indicated how the nationality and conditions of the interpreter might well affect the interpretation, and concluded with the unforgettable statement

> A patient pursuit of facts, and a cautious combination and comparison of them, is a drudgery to which man is subjected by his Maker if he wishes to obtain sure knowledge

JEFFERSON AND THE ARTS

FISKE KIMBALL

Philadelphia Museum of Art

(*Read April 23, 1943*)

AMONG the founders of the Republic, who included other men of wide reading and high scientific attainments, Jefferson was unique in being also devoted to the arts—as an amateur, as a collector, as a patron, and, in architecture, as a gifted creative artist of far-reaching influence

This interest went much beyond any mere formal rounding of general cultivation When among the French, as Minister from the United States, he wrote

> Were I to proceed to tell you how much I enjoy their architecture, sculpture, painting, music, I should want words . The last of them, particularly, is an enjoyment, the deprivation of which with us, cannot be calculated I am almost ready to say, it is the only thing which from my heart I envy them, and which, in spite of all the authority of the Decalogue, I do covet[1]

While it was in Europe that Jefferson first had opportunity to indulge to the full his enjoyment of the arts, an interest in them had begun very early in his life. This was the more remarkable since artistic stimuli and artistic opportunities were then so extremely meagre in America This was especially true in the South, where the scattered plantations were not favorable to activities which flourish chiefly in towns An effort to determine how Jefferson was able to form any adequate idea of the arts, as he very notably did, may be not without interest for the cultural history of America

It is hard to realize how very few and inadequate were works of any of the arts in the Colonies generally, and in Virginia, at the time of Jefferson's youth As late as 1781 he could write, in his *Notes on Virginia*, not unjustly of architecture there in its academic aspects "The first principles of the art are unknown, and there exists scarcely a model among us sufficiently chaste to give an idea of them." Of sculpture, the first work to come to Virginia was the marble statue of Lord Botetourt voted by the Colony in 1771,[2] executed by Richard Hayward in 1773, and set up in the capitol at Williamsburg Of paintings we know almost none in Virginia at that time except portraits, the best of them being scarcely more important than the Knellers at Westover Painters working in the colony were few and poor enough John Wolaston, John Hesselius, John Durand In 1768 was sent from London to Richard Henry Lee in Westmoreland the young Charles Willson Peale's heroic classical full-length of Pitt, but it is doubtful if Jefferson ever saw this ambitious and sophomoric work It was only in 1774 that Peale first painted at Williamsburg

Meanwhile Jefferson had one opportunity in youth to see something of what other colonies had to offer In 1766 he came to Philadelphia to be inoculated against the smallpox by Dr John Morgan, to whom he brought a letter of introduction from John Page, he passed through Annapolis and pressed on to New York The figure of Pitt and the equestrian statue of the King, ordered in that year by the Assembly of New York, were not received and set up until 1770 Philadelphia, more than any other Colonial town, already had a small group of amateurs and collectors, including the men who had lately joined to send the young Benjamin West to Italy Judge William Allen had copies of several Italian works, including a Venus of Titian, the Concert of Giorgione, and a Holy Family of Correggio[3] John Penn's collection, according to Henry Pelham, Copley's half-brother, was "very great and elegant."[4] Former Governor James Hamilton had at Bush Hill what passed for an original by Murillo, a Saint Ignatius taken from a Spanish ship, and copies by West, in his garden were "seven statues of fine Italian marble curiously wrought." As early as 1761 John Morgan had paid tribute to both Allen and Hamilton, "from whom I have received so many favors,"[5] and we cannot doubt that he introduced the brilliant and fashionable young Virginian into their society

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[1] To Charles Bellini, September 30, 1785 (*Writings of Jefferson*, Lipscomb ed., 4 154, 1903)

[2] One might expect Jefferson, then in the House of Burgesses, to have been on the committee regarding this, but he was not *Cf. Journals*, 1770-1772 138. We do not know that he was particularly a friend or admirer of Botetourt, as he had been of the preceding governor, Fauquier

[3] Copley to Henry Pelham, September 29, 1771 (*Copley-Pelham Letters* 163, 341, 1914)

[4] Henry Pelham to his mother, November 18, 1774 (*Ibid* 272). For further evidences on Philadelphia collections, *cf.* C and J. Bridenbaugh, *Rebels and Gentlemen:* 213–215, 218, 1942

It was doubtless to Morgan himself, however, that Jefferson owed his real initiation into the arts Morgan was born in 1735 and was thus but eight years Jefferson's senior Besides studying in London, Edinburgh, and Paris, he had made the Grand Tour of Italy,[6] had followed James Byers' "Course of Antiquities" in Rome, had a library including works on art, architecture, and archaeology, and had brought back from Italy a notable collection of copies of old masters as well as of drawings and engravings of both paintings and architecture He owned, for instance, Vignola's work on the orders of architecture, he had been to Vicenza, and "visited several elegant palaces built by Palladio and the Theatrum Olympicorum," of which he had "procured a pretty exact plate" We shall not be mistaken in supposing that, during Jefferson's weeks in Philadelphia, Morgan found in him a receptive disciple, that in the field of art Morgan's example was as fruitful for Jefferson as that of Wythe, Small, and Fauquier in other fields, and that Jefferson promised himself not to fall behind him in the adornment of his own future dwelling

Not until the year 1773 do we know definitely of any copies of old masters in Virginia On March 4 of that year the painter Matthew Pratt, of Philadelphia, who, like Peale, had studied with West in London, advertised in the *Virginia Gazette* that he had brought with him to Williamsburg and was exhibiting and offering for sale "a small but very neat collection of paintings," six of these being after old masters They included his own mediocre copy of West's copy of Correggio's "St Jerome" (that is, the Holy Family with Saint Jerome), another "Holy Family," and his copy of Guido's "Jupiter and Europa"[7] By the 18th Pratt was evidently leaving Williamsburg to paint near Richmond and, later, at Hampton, but the pictures for a time remained visible near the Capitol Jefferson's accounts show that he happened to be in Williamsburg for a week during this fortnight We cannot doubt that he, who never failed to see any curiosity, improved the opportunity to visit the exhibition, but we shall see that the particular works shown cannot have made a favorable impression on him He bought none, and did not add their subjects to his lists of desiderata

It was in music that Jefferson first was able to indulge his tastes, through a serious mastery of the violin, which he had played since boyhood In his earliest surviving pocket account books, which begin in 1767, we find frequent items for fiddlestrings With Governor Fauquier, himself a musician, Jefferson formed one of a little group of amateurs who played often at the Palace, prior to Fauquier's death in 1768 Jefferson continued to study the violin with Alberti, a gifted virtuoso who had come to Williamsburg with some players, and to whom Jefferson's payments begin in 1769 Later Jefferson persuaded Alberti to come and live at Monticello, where he took lessons for several years "I suppose," Jefferson wrote, "that during at least a dozen years of my life, I played no less than three hours a day"[8] He lost no opportunity of acquiring fine instruments, one in May 1768, which would seem to be the Cremona he still had when he died, another for which, "together with all his music composed for the violin," he pledged a large sum to John Randolph in 1771, and which he acquired when Randolph went to England in 1775 These two, he said, "would fetch in London any price" Nicholas Trist, who married Jefferson's granddaughter, quotes him as saying he had to lay aside his violin on the eve of the Revolution,[9] but we still find payments for fiddlestrings, as well as for a music stand, on his arrival in Paris, where in 1786 he bought a small violin, his third Even after he had broken his right wrist, indeed when he was Secretary of State, he had his fiddle bow mended, and on the eve of retirement laid in a good supply of strings.[10] In 1800 he was still buying music

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[5] The Bridenbaughs (*ibid* i 215) call Morgan the "foremost of the Philadelphia collectors," and chronicle the visits of John Adams and others to him

[6] *Journal of Dr John Morgan from Rome to London, 1764, with a fragment of a Journal at Rome 1764, and a Biographical Sketch, 1907* This includes a list of articles collected by Dr. Morgan during his travels.

[7] W Sawitzky, *Matthew Pratt* 29 ff, 1942 These copies of Correggio and Guido survive and are there illustrated.

[8] Documents on Jefferson's early attainments in music are assembled by Marie Kimball, *The Road to Glory*, 1943, here supplemented by later entries in his manuscript account books. A fuller discussion will be published by Carleton Sprague Smith and Helen Bullock.

[9] H. S. Randall, *Life of Jefferson* 1 131, 1858.

His musical interests were not limited by the violin In 1771, during his courtship of Martha Wayles, herself musically gifted, he ordered a clavichord from Hamburg, then wrote "I have since seen a Forte-piano and am charmed with it Send me this instrument instead of the Clavichord "[11] Some keyed instrument he must always have In Philadelphia in 1783 he bought a clavichord, in Paris he first hired a piano, then bought a harpsichord, in Philadelphia in 1792 he had a spinet, in 1800 he purchased a piano for $264 Writing from Williamsburg to Paris in 1778, during a lull of the Revolution, he speaks of music as "the favorite passion of my soul" and makes his celebrated proposal to create a "domestic band of musicians" by importing workmen in various trades he ordinarily employed who could also "perform on the French horn, clarinet, or hautboy, and bassoon " Consolation for his unsuccess in realizing this plan he found, while abroad, in frequent attendance at the far from amateurish Concerts Spirituels at the Tuileries

Very early he had sought, as Edward Randolph said, "to collect a library, not merely amassing a number of books, but distinguishing authors of merit and assembling them in subordination to every art and science " His library catalogue, preserved in manuscript, lists both his books on music and the musical compositions which he owned By differences of ink and handwriting[12] it permits us to recognize which are the original entries for his earlier acquisitions and desiderata, down to his expected departure for Europe in 1782 Among the books then owned were Brenner's *Rudiments of Music*, Dr Burney's *Present State of Music in Italy*, and *in Germany*, and manuals of instruction for the violin, the harpsichord, and the German flute There are two pages of titles under Music—Vocal, with works ranging from Handel and Pergolesi, or Purcell's *Orpheus Britannicus*, to drinking songs, and two pages of Music—Instrumental, beginning with Corelli's concertos and Vivaldi's concertos. Later Jefferson made a table of all his instrumental music by over a score of authors, classified as sonatas, concertos, duets, and so forth, including also works later acquired, such as Haydn's 1st, 2nd, 3rd, 47th, and 48th sonatas, and his 51st and 52nd concertos No later composers such as Mozart, not to speak of Beethoven, are listed Considerable fragments of this great library of music are preserved at Monticello, along with Jefferson's music stand for violin, and an ingenious four-sided music stand of his own design for playing quartettes

Jefferson early dreamed of a house and garden of his own making At twenty-one, we know, he bought "James on Gardening," translated from Leblond's manual of the French formal style of LeNôtre In the next year, with the poet Shenstone's collected works, hymning nature and wide mountain prospects, he acquired the plan and description of the author's seat, The Leasowes, a famous example of the new English landscape garden. By 1767 he had determined to build on a site far more romantic then Shenstone's, on the summit of the little mountain rising above his birthplace, Shadwell, a site to which he then gave the name he was to make so famous, Monticello. Deep in books on architecture, of which he already owned a number, he gave his preference from the start to that of Palladio, with its appeal to the lawfulness of nature, to harmony of mathematical proportions Making himself master of architectural drawing to a degree quite beyond the skill of any Colonial builders or amateurs down to this time, he designed a house with Palladian porticoes of an academic correctness new in the southern Colonies. By a genial adaptation to his mountain site of Palladio's schemes of colonnaded service wings, which he depressed below terraces, he gave his house an uninterrupted sweep of the superb panorama of plain, of valley, and of mountain range

Pope asks

> "Who then shall grace, or who improve the soil?"

and answers

> "Who plants like Bathurst, or who builds like
> Boyle."

Jefferson, like Boyle—the architect Earl of Burlington—before him, was building in Palladian style, he early undertook ambitious planting also. "It has always been my passion," he wrote years later to the Comtesse de Tessé [13] His ideas for it, in the landscape style, he must already have acquired with Shenstone's works in 1765.

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[10] Accounts, October 12 and December 24, 1793

[11] *Writings*, Lipscomb ed , 4. 231, 235, 1903

[12] Cf Fiske Kimball, *Thomas Jefferson, Architect*, 90–91, 1916

[13] Letter of January 30, 1803, in G. Chinard, *Trois amitiés françaises de Jefferson* 125, 1927

Shenstone's *ferme ornée* gave him an example of the method inaugurated by William Kent, when—as Walpole wrote—he "leaped the fence and saw that all nature was a garden." Jefferson was the first American to hold this belief, and to act on it.

Already his architectural skill was being laid under contribution by others: as in a design for his friend George Wythe, and for an enlargement of the building of William and Mary College prepared at Governor Dunmore's request. Here Jefferson made a plan with a great arcaded court reminiscent of the town-palaces of Italy as shown by Palladio. When he himself became Governor in 1779, he projected a transformation of the Palace at Williamsburg—by pedimented porticoes of eight columns, the "full width of roof"—into the form of a temple, prophetic of extremes of the classic revival not yet even proposed abroad.

For any broader idea of the other arts he had also to look to books. The chapter on Sculpture in his library catalogue begins with Spence's *Polymetis*, first published in 1747. Then came François Perrier's folio *Signa et Statua Antiqua* (as Jefferson gives the title), a hundred statues drawn and engraved in Rome in 1638. Significant among the desiderata was the *Monumenti inediti* (1767–1768) of Winckelmann, whose epoch-making *History of Art* of 1764, first declaring the superiority of Greek art over the Roman, Jefferson later acquired while abroad.

The chapter on Painting begins with *Webb's Essay on Painting, An Inquiry into the Beauties of Paintings*, 1760, which Jefferson recommended to Robert Skipwith as early as 1771. Other books he surely had before he went abroad were Jonathan Richardson's *Theory of Painting and Essay on a Connoisseur*, which first appeared in 1715 and 1719, *Da Vinci on Painting*, and William Gilpin's *Essay on Prints*, first published in 1768, and the *Aedes Walpoliana*, 1743. Webb, Richardson, and Gilpin were alike in expounding the academic style, with much emphasis on the handling of historical subject matter, classical and Biblical. Among what seem also to be early entries in his catalogue are *The perfect painter*, 16°, and *Le vite de Pittore di Giorgio Vasari*, though we cannot be certain that these were actually acquired before he went abroad. One book, listed as a desideratum, he did not subsequently acquire: *Richardson's account of paintings, statues, etc in Italy*, first published in 1722. It will be obvious, however, that he had seen and read this—perhaps indeed he had owned a copy before the fire of Shadwell in 1770—and that it was a chief source of his ideas regarding sculpture and painting.

Jefferson very early planned to adorn Monticello with casts and copies of famous works. About 1771 he listed these in his building notebook.[14] The list of statues desired is as follows:

Venus of Medicis, Florence
Hercules of Farnese, Rome

Apollo of Belvedere, Rome
Antinous, Florence

Dancing Faunus
Messenger pulling out a thorn
Roman slave whetting his knife
The Gladiator at Montalto
Myrmillo expiring, Rome
The Gladiator reposing himself after
the engagement (companion to the former)
Hercules and Antaeus
The two wrestlers
The Rape of the Sabines (3 figures)

This selection is made with discrimination from among the works then most admired. It is interesting to canvass how the young enthusiast could arrive at such a list. Obviously his knowledge must have come from books, the field is narrowed to those he owned, or had seen and desired. Among these, we find that his chief source was indeed Richardson's critical work on the statues and paintings of Italy. Richardson speaks at one point (p. 156) of the Meleager, "one of the seven principal Antique statues, the others are the *Venus*, the *Apollo*, *Hercules*, *Gladiator*, *Laocoon* and *Antinoüs*." Most of these are described singly elsewhere. Of them Jefferson included five, excluding the group of the Laocoon and the figure of Meleager, which Richardson merely mentions without describing it anywhere. Joseph Addison's *Remarks on Several Parts of Italy*, published in 1705, which Jefferson also owned before he went abroad, mentions at one point (p. 341) as among the most famous statues, "the *Venus de Medicis*, the *Silenus* with the Young *Bacchus* in his Arms, the *Hercules Farnese*, the *Antinous*." But that much of Jefferson's list was indeed from Richardson is shown by many evidences: the form of the names like "Venus of Medicis" or "Faunus dancing", the inclusion of works not mentioned by Addison, like the "Myrmillo dying," at the Palazzo Pamfili, of which Richardson gives a long appreciation (p 301) On the other hand, it is in Addison and not in Richardson that we find the forms "Roman slave whetting his knife" and "The two wrestlers," and mention and praise of the Hercules and Antaeus at the Pitti Palace.

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[14] *Thomas Jefferson, Architect*, fig. 79

Jefferson did not content himself merely with descriptions We have seen already that he owned the folios of Spence and of Perrier In the *Polymetis*, limited to representations of gods and demigods, were fine full-page plates of the "Venus of Medicis," the Apollo Belvedere, and the Hercules Farnese In Perrier, published before the Medici collection was removed to Florence in 1677, were many more, not only the Hercules, the Apollo, the Venus, and the Antinous (Hermes) of the Vatican, but the Wrestlers, and the Myrmillo Expiring. Even these books were evidently not the end of his resources, a few scattered allusions not derived from them must have come from other works which he had somewhere seen We observe that Jefferson did not merely follow any single list, but made his own independently, on the strength of his reading

The building notebook also listed paintings "St Paul preaching at Athens, St Ignatius at prayer, Jephtha meeting his daughter, Sacrifice of Iphigenia; History of Seleucus giving his beloved wife Stratonice to his only son Seleucus who languished for her, Florence, Diana Venetrix (see Spence's Polymetis) "[15] It is hard to know where he formed his idea of these works aside from the last Among them only the St Paul preaching at Athens, in Raphael's cartoon, receives special emphasis in the books we have mentioned

In 1782 he added a note. "Bellini tells me that historical paintings on canvas 6 f by 12 f will cost £15 sterl if copied by a good hand "

In that year, planning to go abroad, he obviously hoped to be able to secure such copies, as he transcribed his desiderata[16] with some additions, with the dimensions of certain of the paintings, and now significantly not merely with the subjects but some of the painters' names The list of these then stood·

Belisarius from Salvator Rosa (Date obolum Belisario)
Jeptha meeting his daughter by Zocchi
St. Ignatius at prayer by
The Prodigal son· from Salvator Rosa, 8f 3I high 6f 5½I wide
Susanna & the two elders by Rubens, 6f high, 7f 8½I wide
The stoning of St. Stephen from Le Soeur, 9f 8½I high, 11f 3¾ wide
Curtius leaping into the gulph, from Mola, 6f 6½I high, 11f 4½ wide
Cocles defending the bridge, companion to the other
Paul preaching at Athens, from a cartoon of Ra Urbin
The sacrifice of Iphigenia
Seleucus giving his wife Stratonice to his son

Five of the additions to the earlier list, including the four for which dimensions are given, are selected from the collection of Sir Robert Walpole, at Houghton, catalogued by Horace Walpole in his *Aedes Walpolianа* All the additions find mention in that work, and the dimensions are identical with those there stated In the Introduction Walpole stresses particularly the genius of Salvator Rosa, mentioning both the Prodigal at Houghton and Lord Townshend's Belisarius, he praises Le Sueur's Saint Stephen as equal to Raphael, and he mentions with admiration Mola's Curtius which, like his Horatius Cocles, is very fully annotated The Susanna of Rubens is not specially distinguished or described, this choice from among the many works listed by Walpole was Jefferson's own Clearly all the paintings were chosen primarily for their subjects, with the moralizing character then so much valued. The artists were major figures of the admired academic canon, not excluding baroque masters.

The library catalogue also lists a few early desiderata in the way of prints, chiefly by Hogarth, with twelve "from dramatic and humorous paintings of Hayman (of Falstaff for the most part) " We have, alas, no list of the prints Jefferson ultimately owned, like that of Washington's at Mount Vernon [17] An inventory of taxable property at Monticello in 1815 lists, besides portraits in oil and crayon, "64 pictures, prints, engravings with frames more than 12 i," and 39 do, under 12 i. with gilt frames." As Jefferson's manuscript catalogue of his paintings, though incomplete, lists fifty-five with religious or mythological subjects, this would give him perhaps forty prints. As in the case of the major arts, his interest in prints became more and more specialized in historical and American subjects.[18] In his accounts for 1790 we find "Gave J Trumbull order . . . for 2 sets of engravings from his Bunker Hill and Death of Montgomery", in 1800, "Gave Birch an order . . . for 5 D for plates"—doubtless William Birch's celebrated views of Philadelphia then appearing One of Jefferson's sets of the Trumbull engravings now hangs again at Monticello Although Jefferson bought engraving utensils in Paris in 1786, we do not know that he joined so many famous amateurs of that period, as diverse as Madame de Pompadour and Goethe, in attempting himself the practice of this art

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[15] Shown there on plate XIII, figure 4, is an onyx of the subject "in Senator Buonarroti's collection at Florence "

[16] In his library catalogue, after the desiderata in the way of books on art

[17] Manuscript inventories in the Library of Congress excerpted by R T H. Halsey, "Prints Washington Lived with at Mount Vernon," in *Bull. Metropolitan Mus. Art* 30: 63–65, 1935.

It was in Paris, the capital of the arts, that Jefferson had opportunity to indulge all his fondness for them, during his five years as Minister from 1784 to 1789[19] He was not slow in forming close relations with leading figures, headed indeed by the Comte d'Angiviller, Directeur des Bâtiments, Jardins et Manufactures du Roi, who himself had a very choice collection Baron Grimm, agent of the Empress Catherine and author of the *Correspondance littéraire*, which kept foreign courts abreast of the latest developments in letters and in the arts, was another intimate, who came often to Jefferson's elegant house in the Champs Elysées In the salon of Madame d'Houdetot, friend of Rousseau and Saint-Lambert, in the intimacy of Madame de Tessé at her superb estate of Chaville, of the Duchesse d'Anville, of Madame de Staël, he knew all the leading figures of the world of taste

The happiest picture of Jefferson's indulgence in these tastes is the record of the idyllic days of early September 1786, passed in company with the beautiful and passionate Maria Cosway, herself a painter, seeing the King's library, the châteaux of Madrid, of Marly, of Louveciennes, attending the Concert Spirituel, seeing the Garde Meuble, buying pictures, engravings and books, hiring a pianoforte—"after dinner to Saint Cloud, from Saint Cloud to Ruggieri's, from Ruggieri's to Krumfolz"—no wonder that his heart for once nearly triumphed over his head!

Almost immediately on his arrival in Paris, in August 1784, Jefferson began buying casts and pictures,[20] at first rather casually and for small sums These doubtless included such copies as that of a Holy Family of Raphael now at Monticello Very soon, however, he was buying original works of some importance From the De Billy collection, sold November 16–18, he acquired No 21, a weeping Virgin catalogued as by Carlo Maratti The next February he bought extensively at the sale of the cabinet of Dupille de Saint-Severin, Nos 36, 59, 248, and 306 They were a St Peter of Guido Reni (72 francs), a Daughter of Herodias with the head of St John the Baptist attributed to Simon Vouet (100 francs—the picture survives, at Monticello)[21], and a Prodigal Son by an unknown master (53 francs)[22] These and many more, which later adorned Monticello, were described by Jefferson in a manuscript catalogue with appropriate Biblical references and classical quotations

Among fashionable living artists, it is very easy to patronize the ones who are soon forgotten Jefferson showed in art the same prophetic insight as in politics For assistance in drawing up his designs for the new Virginia capitol he turned to Clérisseau, author of the *Antiquités de Nismes* and a pioneer of classical enthusiasm in France With Legrand and Molinos, Jefferson studied their method of building the great dome of the Halle au Blé, which he was later to recommend for the dome of the Capitol in Washington For the statue of General Washington, commissioned for Virginia, he sent across the Atlantic in 1785 the sculptor Houdon, supreme in portraiture Houdon also made the bust of Lafayette for the state as well as Jefferson's own bust Jefferson also had at Monticello plaster busts by Houdon of Franklin, John Paul Jones, Turgot, Voltaire, Lafayette, and Washington. His portrait of Franklin was by Greuze He wrote in 1789, with a preference which time has ratified, "I do not feel an interest in any pencil but that of David"[23] Much later, after the death of Houdon, when the authorities of

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[18] *Cf* Marie Kimball, "Jefferson, Patron of the Arts," in *Antiques*, April 1943.

[19] Marie Kimball, "Jefferson in Paris," in *North American Rev* 248: 72–86, 1939.

[20] *Cf* Marie Kimball, *The Furnishings of Monticello* 7, 1940

[21] It does not correspond in composition with Vouet's treatment of the subject in a painting, now lost, engraved by Claude Mellan, but may well be another version, hitherto unknown, by the same artist

[22] The sale-catalogue entries and prices were kindly transcribed for me by M Michel Benisovitch

[23] *Writings*, Lipscomb ed , 7: 308, 1903

North Carolina sought Jefferson's advice as to a sculptor for a figure of Washington, it was to Canova that he sent them

His patronage and encouragement of American painters were not less enlightened. He owned several works by West He had Stuart twice paint his portrait Trumbull, with his great project for historical paintings of the Revolution, he took into his house in Paris, the original composition for the Declaration of Independence was sketched there

Sculpture, more difficult to acclimate in America, he made every effort to encourage Besides sending Houdon, he patronized Joseph Wright and Guiseppi Ceracchi when they came to America Later, as President, he brought over Andrei and Franzoni to work on the Capitol in Washington

It was in architecture, however, that Jefferson was most to leave his mark While in Paris he was asked to secure a design for the capitol of Virginia, first of all buildings projected to house the new republican governments of America Not content with current fashions, he himself prepared drawings, taking as his model a Roman temple, the Maison Carrée at Nîmes, with its great portico, fitting within the body, pierced by windows, the houses of legislature It was the earliest major affirmation of the ideals of the classic revival in an executed building, transcending the English garden temples which first followed such models, and preceding Napoleon's temple of victory, the Madeleine in Paris, by a score of years Of a piece with the republican enthusiasm for the heroes of Plutarch, the Cincinnati, the building was a manifesto of classic monumentality, simplicity, and dignity, which established the character of the public buildings of the new states and of the nation

When federal government was established by the Constitution, Jefferson, as the first Secretary of State, had further opportunity to implant his artistic ideas He aided the French engineer, L'Enfant, in the planning of the new Federal City of Washington, and urged on him the adoption of classical models for the public buildings. When L'Enfant quarrelled with the authorities, Jefferson proposed holding a competition for designs for the Capitol and President's House, and himself submitted, anonymously, one for the latter based on Palladio's Villa Rotonda, while encouraging the gifted French architect Stephen Hallet to prepare one for the Capitol within the body of a peristylar temple

Retired in 1793 from Washington's cabinet and, as he hoped, from public life, Jefferson planned a remodelling of Monticello on more Roman lines, adapted in part from the Hôtel de Salm, now the Palace of the Legion of Honor, which he had admired in Paris as one of the latest architectural novelties Its effect of a single story, its Roman dome, had their influence on the house we know today, certainly one of the most beautiful, as it is one of the most original, of American buildings Over many years Jefferson continued the development of the grounds, being the first to achieve, as he had been the first to propose, the adoption of the English style of informal, landscape gardening

On his accession to the Presidency, Jefferson did not neglect the opportunity to foster the arts He created the post of Surveyor of Public Buildings, appointing to it Benjamin Henry Latrobe, well trained in England, who had just built in the admirable Bank of Pennsylvania the first monument of the Greek revival in America. It was he who completed the wings of the old Capitol, and who began its rebuilding after it was burned by the British To Jefferson himself, while he occupied the White House, are due its circular portico toward the Potomac and its long flanking colonnades

For his friends in the Virginia Piedmont Jefferson gave the designs of such great houses as Edgehill, Farmington, Edgemont, Ampthill, and Barboursville, their tall Roman porticoes establishing the type to prevail in the ante-bellum South

As a creative artist in architecture, Jefferson transcended the inherent philosophical weakness of the systems, academic and neo-classic, which he had espoused A clear analysis of practical uses, an instinctive sense of form, tacitly directing his processes of mathematical determination, led him to a genial synthesis in which use and form were embodied with crystalline unity and perfection This is evident above all in his greatest achievement in building, the University of Virginia His brilliant conception of the "academical village," with its pavilions for the professors, their classrooms and living quarters, their balconies and gardens giving privacy in the midst of the communal life, its ranges of rooms for the students, their colonnades and arcades for communication under cover, its centralized and centralizing library as the heart of the institution, was given artistic form, within his classical allegiance, by the contrast of the "perfect models" of "cubical" and of "spherical architecture," by the dominance of the Rotunda, the unifying repetition of the porticoes, the melodious treble of the white columns against the warm thoroughbass of the brick walls

Fortunate we are as a nation that among our great founders was a man of such artistic culture and creative power, who could endow us with his example and his works

THE OLD POLITICAL PHILOSOPHY AND THE NEW

JOHN DICKINSON

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(*Read November 20, 1942*)

There is no place in all the world more appropriate for a discussion of the philosophy of government than the neighborhood of Independence Hall In the building across the way, there took place a century and a half ago the most fruitful discussion and wisest application of political philosophy in human history. Today men stand once more at an epoch which calls for creative institution-building, and it is therefore timely to take stock of our current ideas about government, in comparison with the ideas of the men, some of them members of this Society who sat in the Convention of 1787 and framed the Constitution

I

When we speak of the political philosophy of an epoch it is well to remind ourselves that it almost inevitably consists of two layers. There is, first of all, the stratum composed of the common elements in the thinking, writing and speaking of the comparatively small number of people who in any age devote themselves to conscious reflection and speculation about government There is, secondly, the stock of ideas which dominate those who are powerful enough or influential enough in a community to give direction and shape to actual political forces Sometimes these two strata of what may be called theoretical ideas on the one hand, and practical ideas on the other, are wide apart and hardly within hailing distance of each other This was so, for instance, during the middle ages and the result was then, as it always is, to increase confusion on the political scene One of the noteworthy features of the epoch of the American Revolution is that then, perhaps more than in any other era, the ideas of the avowed political philosophers of the time, the speculative writers and students who dominated the world of books, coincided with the dominant ideas of the men who were in a position to translate ideas into practice. The men of books and the men of action were in agreement

For this there were two reasons. The first is that the political leaders of the time, the men who could carry elections and were returned to the colonial and state legislatures, to Congress and to constitutional conventions, were men who were familiar with speculative political philosophy, the philosophy of books and thinkers The literary remains of Jefferson and John Adams show that they had done more hard scholarly work, more note-taking and digesting and commenting on their wide reading, than is usual on the part of professional scholars The same thing is true to only a lesser degree of a long list of their contemporaries — Otis, Parsons, Ellsworth, Jay, Hamilton, Patterson, James Wilson, Gouverneur Morris, Chase, Martin, Wythe, Madison, Richard Henry Lee, Arthur Lee, Edmund Randolph, Marshall and Iredell

The question may well be asked why men of this type were returned to office, or to put the question in another form, why men with political ambitions took the time and trouble to become scholars The answer is that their constituents expected it The electorate was in the main dominated by relatively small and compact groups of comparatively well-to-do and well-educated people who expected their representatives to have the same training, interests and information as themselves. In the South material which is coming to light in increasing quantities shows that the planters who dominated the elections were in many instances men who had a sufficient interest in learning as it was then understood to own considerable libraries, including the works of the leading speculative writers on government. In New England the tradition of a ministry versed in book-learning led for a time to insistence on learning as a qualification for leadership In the middle colonies, New York, New Jersey, Pennsylvania, leadership was in the hands of the lawyers at a time when legal education covered a far wider range than it has subsequently come to do, and included the philosophy of government as one of its elements.

This is the first reason for the coincidence between theoretical and practical ideas about politics in the era of our constitution-building. There

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was a second reason, and this was that the political philosophers whose ideas were dominant at the time the speculative writers whose books embodied the current political philosophy, were men who aimed to reach an audience composed not of experts, technicians or research students, but of practical men, planters, lawyers merchants, men of the world and of affairs. This was preeminently true of the two great writers who furnished most of the political ideas, practical as well as theoretical, of the mid-eighteenth century, Locke and Montesquieu. Both these men were able to write for practical men and in terms that practical men would understand, because they were far from being closet philosophers themselves.

Locke as the private secretary of Lord Shaftsbury, as Secretary of the Board of Trade and Plantations, as a partner in colonial speculations, had a life-time of experience in business and politics when he first began to write at the age of fifty. Montesquieu was a judge a large landowner and a familiar member of the Court and the great world during the twenty years that he devoted to writing the *Spirit of Laws*. Such men spoke the language of the world and brought political philosophy, as Blackstone brought law, within the comprehension of men whose lives were spent in practical affairs. The same thing was true in a more indirect way of another important body of ideas which, along with the contributions of Locke and Montesquieu, formed part of the mental furniture of the eighteenth century. These were the ideas of legal morality and fundamental rights and duties which had been worked out by Grotius and were applicable not merely to international relations, but to the relations between individuals within states. The ideas of Grotius were known in eighteenth-century America not so much directly as through his commentators, Burlamaqui, Rutherford and Vattel, but the ideas themselves bore the stamp of the great Dutch thinker who spent an active life as an official, a judge and a diplomat. In the case of Grotius, Montesquieu and Locke alike, their ideas as philosophers were influential with the American statesmen of the eighteenth century because they were themselves in part statesmen while those statesmen were in part scholars and philosophers.

Against this background of concurrence between philosophy and practice in the formative era of our Constitution, one of the most significant features of our political experience since the Civil War has been the ever-widening breach between practical politics on the one hand and a philosophy of government on the other. We can hardly think of Franklin, Jefferson, Adams and Madison apart from their philosophy of government, on the other hand it is difficult to think of a philosophy of government in the same breath with Roscoe Conkling and Blaine, McKinley Mark Hanna, Speaker Joe Cannon, Senator Aldrich Harding, Penrose, Weeks, Longworth, useful as some of these men may have been in various ways. A few years ago we had reached the point where it was an accepted truism that a philosophy of government was something altogether too remote and academic for a politician to afford. To be suspected of having one would have been enough to ruin a man's political career.

The reasons for this development are sufficiently obvious. On the one hand the extension of the suffrage had brought into public affairs men whose background and training had never accustomed them to analyze problems or think in terms of principles. Their constituents did not expect them to do so and would not have understood them if they had. Again, the life of the time was so busy, the pace and tempo so rapid, opportunities were so numerous and fleeting that the strong men of the period could not have advanced themselves if they had lingered to analyze and reflect. Thus the men of practice abandoned philosophy, and the divorce was by mutual consent, for at the same time philosophy abandoned practice.

After the aberrations of the French Revolution political philosophy took refuge in the schools. Throughout the nineteenth century speculations about government involved themselves in the obscurities of German metaphysical thinking from Kant to Hegel, which found no response or understanding in work-a-day America. In this country the broad stream of eighteenth-century thought narrowed down into arid and unsuggestive commentaries on constitutional texts which were usually too abstract for practical men to understand, and too unimportant to be worth the effort. The philosophy of government became a harmless occupation for a few people who had nothing to do with government.

But philosophy always comes to life under the strain of great crises. Under the impact of the last war and the pressure of the ensuing economic upheaval it could not help springing to life, and the only place where there were embers which could glow into flame was in the schools. The school-men of this generation have been at work for over a decade in making political philosophy a force again. Once more it has emerged as a powerful factor in political practice, but it has emerged from a source divorced from practice. The new philosophy has been shaped primarily by academic thinkers revolting against their own background.

After the last war the influx of students into our American universities led to a great and sudden increase in the number of young university teachers. Among these, many who were teachers of politics, law and economics, became acutely discontented with what seemed to them the irrelevance and practical ineffectiveness of the ideas with which older scholars in the same fields were working. Drawn into the universities after the excitement of the war as these young men were, their discontent was motivated in part by a desire to be immediately useful in the practical world from which scholars seemed to be so completely excluded, and in part by a youthful appetite for intellectual and emotional adventure. From their standpoint as outside observers of passing events, they had seen the world shaken to its foundations and the hope of a new day shattered by practical politicians using slogans borrowed from traditional concepts. Accordingly many of them made up their minds that all hitherto prevalent ideas, all "old" ideas, were dead ideas and, worse than that, were a positive obstacle to progress in the fields of thought and action.

University teachers of the social sciences, while for the most part shut off from practical experience in their own fields of study, lived in an environment where they were in constant contact, socially if not intellectually, with their colleagues in the natural sciences. They had constantly before their eyes the way in which the advances in natural science during recent years were producing spectacular practical effects on the world at large. They saw the country's way of life transformed by chemistry and applied physics, and they noted the vast humanitarian achievements of medical and sanitary science. These accomplishments of companion academic disciplines roused a spirit of emulation, if not of actual jealousy, in academic students of the social sciences, and in an indirect but nonetheless powerful way, the recent path of natural science has had much to do with shaping the new philosophy of government.

It is true, that professors of government and law, almost to a man, are not qualified to follow and understand the details of the new physics, but this has not prevented them, any more than it has prevented the rest of the world, from being dazzled by the scientific revolution that is associated in the popular mind with the name of Einstein. Doubtless, few, if any, of them would be able to recite on relativity, the quantum theory, or the principle of indeterminacy, but they have all been persuaded that it is to the introduction of these supposedly revolutionary conceptions that the vast practical achievements of modern physics are due. Great scientific discoveries always have a way of generating a particular mental atmosphere among laymen, and the atmosphere created by relativity and the new physics has left important marks on current political speculation in at least two particulars.

In the first place, it has confirmed the view that progress can be made only by the abandonment of principles which have hitherto been accepted as basic. The great advance in physics is rightly or wrongly supposed by students of politics to have been due to the refutation and demolition of Newton, and the inference is then drawn that comparable progress in the philosophy of government can only be achieved by the rejection and abandonment of whatever ideas derive from Locke and Montesquieu, who have hitherto been regarded as the Newtons of political science.

Secondly, students of law and politics have obtained a distinct impression that the work of Einstein and other recent physicists and mathematicians has radically undermined the whole conception that there are or can be such things as laws or principles in the field of science at all. Whatever view scientists themselves may hold on this point, the lay observers of their work have noted how they have apparently stripped scientific laws of the fixity and certainty which once were supposed to characterize them. This has produced a powerful impression on current legal and political thinking. In the past, students of politics have always looked with envy at the supposed definiteness and demonstrability of the generalizations which natural scientists claimed to be able to formulate. Because they were unable to claim such demonstrability and certainty for their own generalizations, students of government looked to natural science as setting a standard which they vainly sought to reach.

Nothing, therefore, has been so comforting to them as now to learn from the natural scientists themselves that even in the field of science, laws and principles of demonstrable certainty are unattainable. From this the political and legal theorists have gone on to conclude that all generalizations about government, all principles supposed to be valid with respect to political arrangements, must necessarily be illusory and futile They have drawn confirmation for this view from the behaviorist school of psychology, whose teaching is understood to mean that all attempts to reduce experience to order by means of principles are mere rationalizations of subjective desires and urges There can thus be no valid or even persuasive criticism of these desires, because all the standards of judgment which might serve as a basis for criticism are but covert tools of opposite desires, and therefore have no superior validity to the desires which they purport to criticize Accordingly there can be no such thing as impartial judgment, since impartial judgment presupposes an objective and independent standard of criticism, which is non-existent

The effect which these impressions, correct or incorrect, drawn from the natural sciences have had on academic thinking in the field of political philosophy has been simply enormous It has created a climate of opinion which is so general and axiomatic that it has not had to come into focus in particular books, because it permeates most of the books that are written, and manifests itself even more significantly in the books that are not written As a result there is an almost complete absence in academic quarters today of serious analytical criticism of current trends and tendencies in government These are accepted as necessarily a matter of purely personal preference and not properly amenable to rational appraisal

Under the influence of the pragmatism of William James and the so-called instrumentalism of John Dewey, scholarly investigation in the field of government has come to be primarily an instrument or tool of dominant desires, and is largely focused on the development of techniques for providing those desires with more complete fulfillment, through propaganda, measurement of opinion, so-called "administrative law," and social and economic statistics These techniques are pursued as ends in themselves and the tendencies they are meant to serve are not analyzed or evaluated from the standpoint of general principles of government, because no such principles are recognized. Rather, they are studied from the standpoint of their relative effectiveness to accomplish ends which are accepted from some outside source

In the main, the tendencies and forces in whose favor recent academic political thought has expressed its own preference are the forces of revolt against previously established social and political arrangements This follows from the view, to which I have already referred, that progress must necessarily come by way of a break with the past It follows also from the view that the tragedy of the last war and the ensuing economic debacle are to be charged against the political leadership of the last generation and against the system and ideas of government which made that leadership possible The academic youth of the country, from their watch-towers in the universities, made up their minds that the groups and elements among our people who had come to the front under our historic political practices have been so selfish and self-seeking as to have betrayed the public interest They concluded that if the old leadership was selfish and the old system wrong then the proper course for them to pursue was simply to lend support by teaching and writing to whatever groups and interests were opposed to that leadership and system Having chosen their side, largely on such grounds of emotional and sentimental preference, they saw no reason to inquire whether the forces with which they proceeded to ally themselves were likewise tainted with self-seeking or not. That would have implied an objective standard of values They became instrumentalists instead of critics By a transition not unusual in the history of agitation, they passed, by an unconscious leap, from moral emotionalism to cynical realism

The developments in current political philosophy which I have been outlining were well under way a decade ago, when suddenly, and almost as the result of an accident, political philosophy again became an influential force in our politics The view then happened to be held in quarters where it could be made effective that persons of practical experience in the subjects with which government deals are likely to be prejudiced by selfish interests. It was concluded that frequently the independence and regard for the public interest which are so essential in governmental and judicial posts can only be obtained by appointing to those posts persons from academic life who are untainted by practical experience As a result, much of the policy of government in recent years, as during the formative era of our constitution, has been shaped by men strongly influenced by a philosophy of government; with this difference, however, that in the older era these men were men of practice who had mastered a theory born of practice, whereas today they are in the main men of theory, whose theory has been largely formed by speculation about other theories.

II

In comparing the old political philosophy and the new, there is an initial difficulty in that the new philosophy fails to make explicit many of its basic ideas. As a philosophy of pure instrumentalism, it expresses itself almost exclusively in the elaboration of programmes and techniques. It does not offer to give an account of itself in terms of principles, but asks us to be content with an announcement of purposes usually phrased in language broad enough for use as a slogan. The old philosophy was also one of programmes, but it regarded itself as under an obligation to expose its cardinal principles for analysis and justification. These are accordingly at hand for inspection, while the comparable principles of the new school must be largely inferred by implication from the programmes in which they are embodied, and so may give rise to considerable difference as to their precise content and meaning. With this reservation in mind, the salient features of the two philosophies may be reviewed.

The old philosophy was no more complimentary in its view of human nature than is the new. Its starting point was that men are likely to be selfish, grasping and unmindful of the proper interests of others, and that this is the principal occasion for the existence of government. It proceeded at once, however, to apply this observation to government itself. Government is intrinsically nothing but the power of one man or a small number of men over other men, and the individuals in whom power is lodged are human beings like the rest, and no less subject to the infirmities of human nature. In the words of Jefferson, "mankind soon learn to make interested uses of every right and power which they possess or may assume",[1] or, as Montesquieu put it, "every man who has any power has a tendency to abuse it, it will be exerted up to the point where it is checked by some other power."[2]

In other words, a selfish exercise of power is to be anticipated on the part of government, even though government is a necessary human institution. Furthermore, because of the amount of power which government inevitably commands, abuse of power by government is especially dangerous. It is particularly to be dreaded because the legitimate function of government is to protect certain fundamental interests of human individuals, and when the power of government is abused, these interests, instead of being protected, are apt to be invaded by government itself. Among such interests are freedom of opinion, freedom of worship and the right of private property. To quote Jefferson again:

> I believe that there exists a right independent of force, that a right to property is founded in our natural wants, in the means with which we are endowed to satisfy these wants, and the right to what we acquire by those means without violating the rights of other sensible beings. The majority oppressing an individual is guilty of a crime and, by acting on the law of the strongest, breaks up the foundations of society.[3]

Thus, even though government may represent a majority and be exercised through popularly elected officials, it must still be organized so as to prevent tyranny by the majority. Accordingly, again quoting from Jefferson:

> It will be no alleviation that these powers will be exercised by a plurality and not by a single one. One hundred and seventy three despots would be as oppressive as one . As little will it avail us that they are chosen by ourselves. An elective despotism is not the government we fought for, but one which should not only be founded on free principles, but in which the powers of government should be so divided and balanced among several bodies of magistracy as that no one could transcend their legal limits without being effectually checked and restrained by the others.[4]

In other words, in spite of, or perhaps just because of, the necessity for government in society, it is essential that government shall be so organized that its power will be checked in two ways: first, by subdivision among a number of governmental organs, each of which should be placed in such a position as to prevent the others from becoming too strong, and, secondly, by limiting the functions of government to what individuals cannot perform for themselves. Quoting from Jefferson once more:

> The way to have good government and safe government is by dividing and sub-dividing [it] through all

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[1] Notes on Virginia, in *Writings*, Memorial ed., 2: 164.

[2] *Spirit of Laws* bk. xi ch. iv.

[3] Letter to Dupont de Nemours, April 24, 1816, in *Writings*, Memorial ed., 14: 490.

[4] Notes on Virginia, in *Writings*, Memorial ed., 2: 162.

> its subordinations until it ends in the administration of every man's farm by himself, by placing under every one what his own eye may superintend [If man is ever to be free] the secret will be found in making himself the depository of the powers respecting himself, and delegating only what is beyond his competence to higher and higher orders of functionaries so as to trust fewer and fewer powers in proportion as the trustees become more and more oligarchical [5]

Unless government is organized on these principles, Jefferson thought that it would inevitably be used as an instrument for the personal aggrandizement of the governors or governing group To quote his language

> The public money and public liberty will soon be discovered to be the source of wealth and dominion to those who hold them, distinguished too by this tempting circumstance, that they are the instrument as well as the object of acquisition With money we will get men, said Caesar, and with men we will get money Nor should our [governors] be deluded by the integrity of their own purposes and conclude that unlimited powers will never be abused, because they themselves are not disposed to abuse them They should look forward to a time, and that not a distant one, when corruption . will have seized the heads of government and be spread by them through the body of the people, when they will purchase the voices of the people and make the people pay the price [6]

All these quotations illustrating the old philosophy have been selected from the writings of Jefferson rather than from other sources because they so fitly express the homely points of that philosophy, and also because Jefferson's influence was so paramount in establishing that philosophy as part of the American tradition One additional quotation may be presented to close the series

> I am not among those who fear the people To preserve their independence, we must not let our rulers load us with perpetual debt We must make our election between *economy and liberty*, or *profusion and servitude* If we run into such debts we must be taxed in our meat and in our drink, in our necessaries and our comforts, in our labors and our amusements, as the people of England are . Our land-holders, too, like theirs, retaining the title and stewardship of estates called theirs, but held really in trust for the [public] treasury, must wander in foreign countries, and be contented with penury obscurity, exile, and the glory of the nation This example reads to us the salutary lesson, that private fortunes are destroyed by public as well as by private extravagance And this is the tendency of all human governments A departure from principle in one instance becomes a precedent for a second, that second for a third, and so on, till the bulk of the society is reduced to be mere automatons of misery The fore horse of this frightful team is public debt Taxation follows that, and in its train wretchedness and oppression [7]

Turning to the new philosophy, this, like the old, starts from a belief in human selfishness, but it is now the selfishness of private persons and interests and not of government, that is emphasized Attention is centered on the fact that throughout the field of ordinary human relations one person or group will often be in possession of some advantage which will enable them to have their way without regard to the wishes of another person or group This inequality of advantage or power between persons or groups may reach a point where the inferior feels definitely oppressed Because of his inferior position it may be said that in a sense he is "regimented" or compelled by others, or by his position with respect to others, to do what otherwise he would not do This is the point from which much of the newer thinking begins—that is to say, from the sentiment of discontent or dissatisfaction experienced by individuals belonging to certain groups when confronted with the superior advantages of others The situation has been presented by one of our leading teachers of politics Professor Charles Merriam of the University of Chicago, who is also a member of the National Resources Planning Board of the Federal Government, in the following words

> Although the private regimentation seen in human slavery has been abolished, there remain wide areas of private regimentation in the swiftly changing industrial order Here the tempo has been so fast that the new rulers have been almost unrestricted in the exercise of vast powers over the lives and fortunes of the workers Employment, wages, working conditions, insurance were in private hands without the earlier responsibility for serf or slave Price-fixing, production control, credits and a long series of far-reaching powers were placed in the hands of individuals or small groups without any

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[5] Letter to Joseph C. Cabell, February 2, 1816, in *Writings*, Memorial ed, 14 421–422

[6] Notes on Virginia, in *Writings*, Memorial ed, 2 164–165.

[7] Letter to Samuel Kerchival, July 12, 1816, in *Writings of Thomas Jefferson* (ed Washington) 7 14, 1869

practical restraint upon them, and with the inevitable appearance of widespread oppression not by government, but by private groups or persons.[8]

This feeling of oppression is apt to be especially acute in connection with all kinds of money transactions, sales, loans, leases, wage-payments, where one or the other party to a bargain feels that he has had to pay too high a price, or has not been permitted to receive as high a price as he thought himself entitled to In such situations of supposed economic inequality, the new philosophy recognizes an appropriate occasion for intervention by government In the words of Professor Merriam, "To break down petty forms of oppression exercised by one man over another has been historically one of the very great tasks of [government] The emancipators may have utilized this power for their own selfish purposes, but they were able to function because they gave more than they took "[9]

In other words, it is on this view a worth-while and desirable end to enlarge the powers of government even to the point where they may be exercised for the selfish purposes of the governors themselves, provided that by so doing readjustments of existing economic inequalities can be effected Governmental power in an extreme form is regarded as beneficent insofar as it is a necessary instrument for introducing what is called "economic democracy," which apparently means approximate equality of social position and economic rewards This was very frankly and forcefully stated by Vice President Henry A Wallace only a few days ago in comparing the present governments of Russia and the United States. He said

> Some in the United States believe that we have overemphasized what might be called political or Bill-of-Rights democracy Carried to its extreme form, it leads to rugged individualism, exploitation, impractical emphasis on State's Rights, and even to anarchy. Russia, perceiving some of the abuses of political democracy, has placed strong emphasis on economic democracy This, carried to an extreme, demands that all powers be centered in one man and his bureaucratic helpers
>
> Somewhere there is a practical balance between economic and political democracy Russia and the United States both have been working toward this In present-day Russia, for example, differences in wage income are almost but not quite as great as in the United States. The manager of a factory may be paid ten times as much as the average worker Artists, scientists and outstanding writers are usually paid even more than factory managers or political commissars The chief difference between the economic organization of Russia and that of the United States is that in Russia it is almost impossible to live on the income from property The Russian form of state socialism is designed not to get equality of income but to place a maximum incentive on each individual to produce his utmost[10]

The purpose for which I have cited this statement of Vice President Wallace is simply to show that according to his special version of the current philosophy, it is a proper function of government to allocate the income of its subjects as an incident of what he calls "economic democracy" The Vice President's statement raises a number of interesting questions, as for example whether human initiative is actually promoted by preventing the accumulation of income-producing property, whether politically supported writers have a greater social value than factory managers, whether it is socially advantageous to pay all factory managers at the same rate, and, if so, whether that rate should not be more than ten times the wage-rate of the average workman However, these inquiries are irrelevant to the major point that there is here expressed a philosophy which makes it a function of government to determine the amount of income which individuals shall receive. If it is regarded as appropriate to vest such a function in government, it would seem to follow as a necessary practical corollary that government must be in a position to direct the processes by which such income is produced Accordingly one of the strategic concepts of the new philosophy, not directly referred to in the foregoing quotation from Mr Wallace, is the concept of so-called "planning "

The idea of "planning" originates in the observation that the separate and unco-ordinated efforts of individuals are not as productive as effort which is geared together into a team, or organization. This suggests the conclusion that if all effort in the nation, or perhaps the entire world, could be geared together into a single organization under central management, the resulting increment of added productivity would be enormous and there would thus be a larger output to share among the workers. It is said that if progressive steps are not taken towards such over-all planning, the operation of purely economic forces will prevent the fullest development of productive capacity, and not only necessitate a lower standard of living but also subject our economy to the strain of continual crises. To quote Professor Merriam again

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[8] C. E. Merriam, *The New Democracy and the New Despotism* 155., New York, 1939.

[9] *Ibid* 154

[10] Address before Congress of American Soviet Friendship, *New York Times*, November 9, 1942.

> If by some happy lapse of memory the world should wake some morning to forget the slogans and ideologies of communism and capitalism, the class struggle and political parties, we should confront the realities of technological change and the importance of rapid adaptation, the rise of a gigantic economic unsystem of terrific forces moving around us with incredible speed and force, and a need for the rationalization of this immense procession of evolving forces without central control The inner logic of the situation would drive us to organize for the prevention of chaos, and to plan for the better ordering of social forces
>
> Out of the very complexity of our technological organization comes with resistless force the pressure for a central coordinating system which shall hold the parts in order and prevent their clash and collapse.[11]

This "central coordinating system" of Mr Merriam is apparently what Mr Wallace had in mind when he said that "economic democracy, carried to an extreme, demands that all power be centered in one man and his bureaucratic helpers "

Doubtless the form of the new philosophy which I have outlined goes beyond what is held by most persons in political authority in this country, and certainly beyond anything that is even dreamed of by the mass of the American people However, the implications of that philosophy may be deduced from a mass of proposals for governmental action which have been vigorously pressed in recent years and many of which have already been embodied in legislation, executive orders and administrative rulings. These proposals and enactments cover the fields of labor and wage regulation, taxation, the regulation of business and industry, banking and finance, government fiscal policy and government ownership and operation of industrial enterprises If all these scattered laws and proposals are read together and considered in the light of the policies which underlie them, their implications may be focused in six propositions which, when brought into the open and stated explicitly, would probably be repudiated by many if not most of those who are promoting the programmes in which they are embodied These six propositions may be formulated as follows

1 Where a group or class are dissatisfied with their income, or with the amount of work they must do to earn their income, it becomes the function of government to compel such rearrangements of economic relationships as may be needed to allay the dissatisfaction and remove the discontent

2 This applies exclusively to groups and classes deriving their income from wages, whether relatively high or relatively low, as distinguished from the investment of property

3 Since the rearrangements to be brought about must satisfy the discontented group or class, they must be strictly along lines dictated by the desires of that class, and limited to what it is willing to accept

4 In order for government to be in a position to effect such rearrangements it must have power not only to fix the incomes of its subjects, but also to dictate the distribution of the economic effort needed to produce those incomes—in other words to ration and allocate productive effort

5 Government must therefore have practically unlimited power over the actions and conduct of its subjects and over physical goods within its territory

6 Government having such power must necessarily be concentrated in a bureaucratic organization heading up into a single supreme individual

III

To test this new philosophy by the measure and standard of the old philosophy of Jefferson and his contemporaries would be futile. The two speak a different language and belong to different worlds. The one is not even a departure from the other, as the new physics may be said to be a departure from the old The new political philosophy simply ignores the old as if it had never existed, in spite of its background of two thousand years

Nor is it possible to test the new philosophy by reference to any objective scheme of relative values, for it acknowledges none It has chosen its own set of values and does not admit that they need validation or defense. All that can therefore be done is to point out briefly and by way of description some of the values which it promotes and others which it disregards

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[11] Merriam, *op. cit.* 151.

In the first place, it assumes that government shall be conducted for the preferred benefit of a particular class, those who earn wages, as distinguished from the more skilled who earn salaries and professional fees, or those who derive income from property. The claims and interests of the latter groups are to be definitely subordinated to the former. To be sure all are promised the opportunity to be ultimately converted into members of the wage-earning class, but it is frankly understood that the result of this conversion will be to level down the professional and managerial groups largely if not completely to the standard of the manual and clerical workers. In other words, the worth of managerial ability and professional education, experience and skill is valued only slightly above the capacity of men in general to perform directed labor. All enterprise and all creative activity, material, intellectual or artistic not performed at state direction and as part of the state-organized pattern, will be placed at inevitable disadvantages, if not actually eliminated.

Finally, the earnings of property are to be depressed so as to discourage accumulation on the one hand, while on the other hand opportunities for accumulation are to be diminished. The first result follows from constantly increasing labor costs and taxation, often coupled with deliberately government-subsidized competition, the latter from the limitation of salaries and from high taxes on personal incomes. This discouragement of the accumulation and ownership of property necessarily has two important effects, one economic and the other political. In the economic field the discouragement of accumulation has the obvious effect of checking private investment, which means that the direction of capital into enterprise will become decreasingly a matter of business judgment and increasingly a matter of political decision by government. At the same time in the field of politics there will necessarily be a constant decrease in the number of those who are financially independent enough to afford to differ with the government, while more and more persons will be forced into the class of wage-earners whose incomes are to be fixed by government favor and who are therefore not free to displease government officials. The discouragement of accumulation also means ultimately the cessation of private support for education and research, which are thus on the way to becoming governmental activities, necessarily subject to the political purposes of their masters.

The decisions of the new philosophy in favor of the particular set of results I have just outlined disclose a definite scheme of preferences or values which are radically opposite to the old, and nowhere more so than in respect of the scope and field of governmental power. The new philosophy seeks to accomplish its purpose almost exclusively through government, and those purposes are such that, if government is to accomplish them, it must enjoy practically unlimited power over the bodies, minds and goods of its subjects. For the sake of eliminating the selfishness of private employers toward their wage-earning employees, the current philosophy is thus willing to convert every one directly or indirectly into an employee of a single all-powerful employer, the government.

The question may well be asked whether an omnipotent government, if it should become to all intents and purposes the universal employer, may not be expected to display at least some of the same selfishness which is supposed to constitute the vice of private employment. This question is generally dismissed as irrelevant on the ground that government as it is organized today cannot be selfish, since it represents the public, as distinguished from a merely private, interest. Sacrifice of individuals to this public interest is supposed to be unobjectionable and not to constitute oppression, as similar sacrifice to a private interest would be.

A critical mind may not feel quite satisfied with this answer. The question inevitably suggests itself whether if we look to things rather than to words, government does not in fact always consist of a number of human beings who are likely to have private interests of their own, irrespective of what from one standpoint or another may be called the public interest. Furthermore any given government at any particular time is almost certain to depend more for its support on one group or element in the population than on others. To this extent government cannot help identifying its own interest largely with the interest of such a special group or class of its friends.

Nowhere is this made more clear than in the very situation existing today, when for the time being government is promoting the interest of the wage-earning group in preference to others. Doubtless we may be told that today the special interest of the wage-earners is really the public interest; but whether this is, or is not, so at the moment, there is at least the possibility that at some other time in the relatively near or relatively distant future it may cease to be so, and some other group become entitled for at least a time to consideration in the public interest Accordingly if government should be relieved from limitations and vested in effect with absolute power, then government will always be in a position to select at its discretion the group whose special interest it will choose to identify with the public interest This power of government to select at will some special group or groups for favored and preferred treatment has hitherto always been regarded as the very essence of tyranny

To this it is likely to be replied that government will never have to exercise any such arbitrary power of selection between classes because once and for all the public interest must be regarded as identical with the special interests of the wage-earners as the numerically largest group This is of course a value-judgment of the most arbitrary kind Certainly it is a reversal of all previously accepted thought on the subject to assume that the public interest ever requires the permanent subjection of the rest of the community to a single group, even though that group may happen to constitute a numerical majority In the language of Mr Jefferson already quoted, "the majority oppressing an individual is guilty of a crime, and, by acting on the law of the strongest, breaks up the foundations of society"

Furthermore the argument that, if government always identifies the public interest with the interest of the wage-earners it will never be put to the test of having to select among competitors for its favor, rests on the assumption that it will never have an opportunity to put some wage-earners deliberately ahead of others This again assumes that the wage-earning class constitutes a solid block with identical interests. If this is not true if in fact some wage-earners do at times have interests which conflict with others, then an all-powerful government will be subject to the temptation of using its power to depress certain wage-earners and advance others for its own advantage Unlimited government is arbitrary power and there is no reason to suppose that arbitrary power will not be selfishly used against particular members of the wage-earning class if the holders of power think such a course to their advantage Members of the wage-earning class can never be sure of immunity, merely because they are such, from the usual incidents of unlimited government

To all these arguments which I have been suggesting, as well as to others that could be advanced to the same effect, the new philosophy remains impervious Its votaries are so busily engaged in building the new society to which that philosophy points that they regard criticism as irrelevant and intrusive They are highly sensitive about preserving their standing as practical men, builders pioneers, and therefore, like the business giants of a generation or two ago, they wear an armor of cynicism toward doubters in order that they may go forward undisturbed with their plans They are instrumentalists whose task is to carry out a purpose and not to inquire whether that purpose is worth-while From this standpoint the only relevant inquiry is whether the programme will in fact carry out the purpose—whether in the language of pragmatism it will 'work,"—that is to say, do what is expected of it It should accordingly be legitimate on their own premises to ask the question, whether or not on all the probabilities there is fair ground for expectation that the new programme will do what it is supposed to do

The purpose which is fundamental in the new philosophy is to end the supposed oppression of the wage-earning class This is interpreted to mean the removal of the discontents and dissatisfactions which result in a feeling of oppression on the part of that class The argument is that, under the political and economic order which has hitherto prevailed, the wage-earners have felt aggrieved because individually they have been receiving so much less of the total national product than other individuals who were professional men or salaried executives, or investors who had contributed the tools and plant-facilities of production

To remove this sense of grievance is the primary object of the new programme Its purpose is not to assure workingmen a living wage sufficient to provide them with a minimum standard of decency It has progressed beyond that to the purpose of leveling up the incomes of wage-earners to the point where they will have nearly the same standard of life as professional men and executives, and leveling down the standard of the latter so as to help bring about the same equality In other words, the motive behind the programme is ultimately social rather than economic—it proposes to minimize economic distinctions for the purpose of minimizing social distinctions and removing the feeling of grievance which one man has when he sees another in the enjoyment of superior advantages This is apparently what is meant when it is sometimes said that what labor wants today is "status"

It is clear that such a purpose is an indefinitely progressive one and grows by what it feeds on. If the object is to remove not a fact but a sentiment or feeling, and if the feeling in question is one of inequality, then the objectionable sentiment or feeling may be expected to continue so long as anything which can be felt as inequality continues. Each approach to equality will further the demand for a closer approach. Let us assume, for example, that, in the effort to satisfy this demand, the point is sooner or later reached where the salaried classes, the managerial classes and the propertied classes are all ultimately wiped out and liquidated, and all the members of the community are converted into wage-earning employes of the state. Still there will be no assurance that we are much nearer to satisfying the feeling which we set out to satisfy than we were at the beginning. As differences in income become universally narrower, so that no wide differences but only relatively narrow ones exist, these narrow differences are likely to take on a new importance and become the source of as deep a feeling of grievance as grew out of the wider disparities in the first instance. In other words, if a situation should ever be brought about where the total national income were available for distribution among the wage-earning class alone, without the necessity of sharing it with the managerial and propertied classes, there would still be as much ground for controversy, and as much occasion for a feeling of grievance and oppression as there was before, with only the difference that now the controversy would be among groups and subdivisions within the wage-earning class itself.

Furthermore, long before this point was reached, another source of difficulty would make its presence felt, as in fact it is doing today. This is that, however much wage-earners as a group may crave equality with the property-owning class, there is nothing they insist on more tenaciously than the preservation of existing inequalities among themselves. For example, because of this attitude on the part of labor it has almost never proved possible to increase the wages of the relatively low-paid groups of railroad employes, such as track workers and shop men, without at the same time granting an equal percentage of increase to the highly paid engineers and conductors, thereby actually increasing the inequality between the two groups.[19]

In other words, the demand of labor for status includes not merely insistence on equality with reference to other classes, but an equally strong insistence by some groups of labor on maintaining their relative advantage over other wage-earning groups. One group feels aggrieved if its advantage is not maintained, while the other feels aggrieved so long as the advantage persists. This source of grievance as between groups of wage-earners is accompanied by another ever-present ground of controversy in the conflicting claims of different labor-groups to a monopoly of specific kinds of work. Signalmen claim that members of their groups are entitled to connect certain wires because they control signals; electricians claim the same work because the wires carry an electric current. These so-called jurisdictional disputes increase in number and intensity with the growing self-consciousness of the wage-earners and their increasing sense of power to attain their ends.

Accordingly it seems only fair to expect that if the new programme of government should ever be realized to the point where the community included no other class but wage-earners, there would not only be no decrease, but in all probability an increase, in feelings of grievance and wounded sensibilities among members of that class. The multiplication of opportunities for controversies and disputes would require the multiplication of agencies to deal with them, and the multiplication of these agencies would in turn offer a standing invitation to make further resort to them. The result would be greatly to impede and slow down productive effort. A large amount of the time that would otherwise be spent in working would be consumed in disputing, and a veritable army of officials would be needed to supervise the disputes. Grievances and controversies would become the principal business of the nation. Already we seem well on the way to approximating this condition of affairs today.

As such a situation developed, one of two results would have to follow. Either the productive mechanism of the country would become involved in increasing confusion and inefficiency, with output diminishing and the standard of living declining; or government would in the end have to abandon the attempt to satisfy the sensibilities and grievances growing out of conflicting demands for equality and inequality In order to keep the processes of industry functioning it would have to clamp down, by force if necessary, a rigid caste system under which each worker would have to be content with the amount of pay and the field of work arbitrarily assigned to him In either case the effort to mould the economic system for the purpose of gratifying the emotional sensibilities of labor would have ended in failure Either all productive efficiency would be destroyed, or labor would end by being confined within a straitjacket At the price of removing present discontents we would be purchasing a host of new discontents as fierce or even fiercer than we now know As Edmund Burke said with reference to the French Revolution,

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[19] See Walker D. Hines, *War History of American Railroads*, 161. New Haven, 1928.

> You would not cure the evil, you would only change the names. The thing must in some shape remain The same vice assumes a new body It is renovated in new organs with fresh vigor It walks abroad, it continues its ravages whilst you are gibbeting the carcase It is thus with all those who, attending only to the shell and husk of history, think they are waging war with intolerance, pride and cruelty, whilst under color of abhorring the ill-principles of antiquated parties they are authorizing and feeding the same vices in different forms, and perhaps in worse [19]

Burke's prophecy was fulfilled by the career of Bonaparte

On its own pragmatic test, then, the new philosophy of government promises to fall short of achieving its intended objective Instead of bringing about contentment, placating desires and removing the sense of inferiority, it seems likely, on the balance of probabilities and in the light of the experience so far, to generate progressively new occasions for grievances, new opportunities for injured feelings and a sense of wrong, and to substitute continuing controversy for co-operation A full life materially no less than spiritually is not promoted by making jealousy and resentment of superiority the mainspring of social and political conduct. A socialist state would be the most vulnerable to the operation of that motive, and a succession of blood-purges is usually needed to eradicate it.

It is at this point that there is most clearly revealed the fact that the new philosophy does not have its roots in the experience and observation of practical men Only closet philosophers who have not mingled with men generally and studied their behavior from the standpoint of participants in common action rather than as outside observers, could suppose that life and labor will go on productively on the basis of seeking to placate the sense of inferiority It smacks of the studio and not of the workshop to believe that life can be organized mainly for the purpose of gratifying grievances and jealousies The common man is not benefited or well served by helping him simply to pull down those who happen to be superior, whether in natural talents, steadiness of character or even in purely accidental advantages It is only through placing at his disposal and making available to his use the services and efforts of all who are in a position to exert superior effort, that the life of the common man can be made more abundant in any sense If on the other hand he is taught to nurse jealousies, cherish grievances, harbor a sense of oppression, and make resentment his central motive, he is unfitted to take part in the common co-operative processes which are the only sources of abundant life Indeed, he becomes a focus of social infection, a ready tool for those who seek private advantage by making quarreling the business of their careers No type of tyrant has been more familiar throughout history than the skilful agitator who, as the saying goes, knows how to fish in troubled waters, and how to trouble the waters for his fishing Such men live by sowing a sense of grievance and oppression, and turning the consequent discord to the advancement of their personal ends

In what I have been saying, I have by no means intended to imply that there has not been and may not still be need for legislation or other governmental action in the field of labor relations Doubtless much legislation of that character has been long overdue The protection of the wage-earning class up to a certain point by government is as legitimate and proper an objective of government as the protection of the interests of any other class or group up to a certain point Some of the forms which such protection may assume may be unwise, just as certain governmental action in the supposed interest of industry may prove to be not really so However, this is not the point to which I have been addressing myself I have been advancing no argument against labor legislation as such, but only against a philosophy which holds that labor should be favored without sufficient regard for the interests of other groups and classes in the community, and which, secondly, holds that the protection of labor means the progressive and necessarily endless attempts to alleviate and remove whatever labor may choose to regard as a grievance The vice of this philosophy is not that it is in the supposed interest of labor, but in the fact that it is both destructive and futile It sets out to destroy the necessary balance within the community for the sake of an objective which recedes continually before the effort to attain it

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[19] Burke, *Reflections on the Revolution in France*, Everyman ed 138.

IV

In spite of all this, we are told by earnest and high-minded votaries of the new philosophy that men of good will and humanitarian purpose have no alternative but to accept it This is because any other course, it is said, would lead necessarily to either economic chaos on the one hand or fascism, nazism, Hitlerism, on the other

The argument drawn from the threat of impending economic chaos proceeds on the ground that under conditions as they exist today there is imperative need that economic activity be controlled, co-ordinated and planned by governmental authority if our system of production is not to break down The working of the system must, it is said, be co-ordinated and controlled at the center, or else it will be constantly interrupted by crises of ever-increasing seriousness, which deprive the masses of an opportunity to earn their living This growing inability of the system to function is attributed to the fact that its operations have hitherto been free and uncontrolled, the resultant of countless choices by thousands and millions of independent individuals, and it is said that under modern technology this kind of freedom can simply not be afforded any longer To quote again from Professor Merriam a passage part of which has been quoted before:

> It may be alleged that the affairs of a nation are too intricate to make any useful planning possible But the assumption that these complex affairs will operate automatically is belied by the facts of modern life It is precisely because these automatisms do not work and cannot work that . [there] comes with resistless force the pressure for a central coordinating system which shall at least hold the parts in order and prevent their clash and collapse. The inner logic of the situation drives us to organize for the prevention of chaos.[14]

What this argument amounts to is that we can no longer afford a multiplicity of free independent decisions on the part of a multitude of individuals with respect to their own economic conduct, because of the clashes and inconsistencies which result, and that we must therefore require the multitude to conform to a small number of decisions made for them and brought into consistency by the central authority of government This is of course the exact opposite of Mr Jefferson's view that government should ultimately come down to letting every man administer his own farm and "placing under every man what his own eye may superintend"

The advocates of the new view are correct in pointing out the increasing magnitude and seriousness of the crises which have recently racked our economic system It is not so plain that they are correct in their diagnosis of the cause For a good many years economic events have been due not only to the separate decisions of independent individuals, they have also been powerfully influenced by the organized decisions of men acting in groups, including the decisions of government itself with respect to such matters as tariffs, money, credit and labor relations It seems fairly clear that many of the maladjustments and dislocations which have been among the causes of crises are properly attributed not to the free action of individuals or of corporate units, but to some extent at least to these planned decisions made by government On this point President Harry Gideonse, one of the most judicious among the younger economists, made the following pertinent comment a few years ago

> It is the fad of the day to belittle freedom A recent book by a German economist opened with a chapter entitled, "The Curse of Freedom" Much of the thought of our "best minds" seems to be based on the same philosophy Everywhere freedom is described as anarchy and chaotic competition The remedy is prescribed in terms of coordination, planning, stabilization The words have a wise sound Everything depends, however, on the wisdom of the coordinator or planner If it should turn out to be of the quality that usually accompanies government coordination and planning,—witness Mr Hoover's farm board, our recent tariff legislation, or our management of the gold standard,—it may well be that freedom would have been more constructive than the efforts of the coordinators[15]

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[14] Merriam, *op cit* 151

[15] Harry D Gideonse, "What Price Stability," in the *University of Chicago Magazine*, November, 1933, p. 18.

Incidentally no small part of the troubles of the 1920's which led on to the collapse grew out of the increasing rigidities of labor costs, brought about by trade-unionism and legislation, which helped to inflate the price-level to unprecedented heights During the last war the effort of government to satisfy labor contributed to this inflationary increase in costs and invited vast post war increases in borrowed capital to enable industry to offset these increased costs by the purchase of expensive labor-saving machinery Much of the instability of the economic system, its "top-heaviness" so to speak, was due to these governmental decisions

Accordingly no magic cure for the supposed threat of economic chaos is assured by government planning An unwise plan, supported and enforced by the authority of an all-powerful government, may well bring chaos a step nearer The community, instead of depending for its prosperity on a large number of unrelated decisions, some of which may be wrong while others may be sufficiently right to offset the effects of the former, would at every moment be staking its fortune on the single throw of a decision by government Often the governmental decision might be sound, but government makes sound economic decisions under difficulties This is because it is not free, and would not be free even in a socialist state, to make them on impartial and disinterested grounds—it must always make them under the political impulse to maintain or increase its popularity for the time being, or under the impact of pressures exerted by contestants for power and favor. This difficulty would not be removed even if under socialism all classes but the wage-earners were eliminated, for, as already pointed out, conflicts and antagonisms would certainly emerge, and indeed already exist, between different groups within the wage-earning class

It seems therefore to follow that, however grave may be the threat of economic collapse with which the present generation is confronted, the danger would not necessarily be eliminated or the prospect materially bettered by adopting the new philosophy—the danger would simply be recast in a different form, and we would at the same time, by adopting that philosophy, be definitely abandoning the sources of strength, balance and recovery which are latent in the initiative and resourcefulness of men not regimented and suppressed by governmental power

There is the added fact, not of course regarded by instrumentalists who refuse to recognize and criticize values, that from a broader standpoint, from the long-range standpoint of human civilization at large, a system of regimentation, even if it did in fact provide complete insurance against economic crises, and actually guaranteed a larger quota of economic goods to the present generation, might still be conceivably not worth the cost, because it would at the same time suppress the spiritual and material values of originality, imagination, inventiveness, personal independence and a sense of freedom, the very values which have hitherto been associated most closely with Democracy

This brings us to the final contention that we have no alternative today between accepting the *new philosophy of government on the one hand*, or fascism or Hitlerism on the other For the purpose of this antithesis the new philosophy is presented as a gospel of democracy in the economic sense, a gospel for the common man, aimed at bettering his lot and guaranteeing him the enjoyment of more abundant life Since these are also the objectives of political democracy in the old-fashioned sense, of what Mr Wallace called "Bill-of-Rights" democracy in the speech in which he so frankly suggested that we may possibly have too much of it, the inference is natural that because Hitlerism is the opposite of Bill-of-Rights democracy, it must likewise be the opposite of the new philosophy of economic democracy On this point, however, Mr Wallace's statement leaves room for doubt Mr Wallace apparently thinks that there is also an inconsistency between the new economic democracy and Bill-of-Rights democracy, and if this be true, then in at least one respect the opposition between the new philosophy and Hitlerism breaks down, insofar as both of them are opposed to the "political democracy" which we have hitherto known

Nor is this the only point at which the implications of the new philosophy fail to distinguish it from Hitlerism Whatever the differences between the two, and certainly they are very different in the nature of their emotional appeal and in the intentions which lie behind them, they display similarities in three respects In the first place both are totalitarian, in the sense that they contemplate unlimited, or practically unlimited, government control of everything, property, natural resources, all human conduct and human relations This of course involves a repudiation of the idea of legal controls over government and legally institutionalized limits to government action. This is a necessary consequence of the concept of planning, which can tolerate no limitation on the freedom of governmental discretion to make such readjustments in human relations as may be required to effectuate the government's plan. It is true that the new philosophy professes respect for the legal guarantees of free speech, and for other so-called "personal" rights, as distinguished from rights of property. However, the practical effectiveness of these guarantees is certain to be minimized if government is recognized as having such absolute control over property and income that no individual can afford to offend the government or arouse its suspicions.

The new philosophy presents a second point of approach to Hitlerism in that both emphasize the power-element in government. They conceive government not as an agency for giving effect to decisions arrived at by deliberation and compromise between different points of view within the community, but as essentially power exercised to carry out the plan and purposes of the government itself. The function of government according to this view is to impose on the community a special mould or pattern of its own devising, without regard to contrary interests and desires which it chooses to override. For this purpose, even if a representative legislative body continues to exist, it is thought quite right and proper that the executive should control its decisions as completely as possible and, after those decisions have been made and embodied in legislation, that the executive should, if necessary, refashion them to its own plan by the processes of so-called "administrative law." In other words, government is the imposition on the community of a plan conceived by the executive.

Thirdly, Hitlerism and the new philosophy both hold that governmental power must be concentrated in very few hands. This follows from the necessities of centralized planning, which require that inconsistencies shall be eliminated or reconciled by having all decisions ultimately made by, or cleared through, a single mind or small groups of minds. It follows also from the fact that the new programme is admittedly far beyond the understanding of all save a very limited number of citizens, and that most of the others might not agree with it if they understood. This means that the destinies of the community should in practical effect be entrusted to a select few, marked out for power by their understanding of and sympathy with the programme which in their own entirely honest opinion is essential for the good of the masses.

The point at which the new philosophy professes to differ from the system of Hitler completely and decisively is in its motive and purpose, in its preoccupation with the welfare of the common man. On this it bases its claim and title to be called democratic. Hitlerism on the other hand is said to have constructed its programme with the objective of aggrandizing an elite class, and therein the critical and all-important difference between the two systems is supposed to lie. Certainly the slogans of Hitlerism are different enough from those by which the new philosophy is recommended for acceptance in this country, but if we look to Russia, where something akin to the programme of that philosophy has already worked itself out, the resemblance to the German philosophy in the matter of both techniques and results are striking. Both programmes set out to satisfy the emotional sense of inferiority, and take vengeance for the supposed grievances, of part of the population at the expense of other classes; in both countries these other classes were ultimately liquidated by violence and homicide. Of course in the two cases the classes selected for proscription were chosen on different grounds. Both the Russian and German programmes included a completely planned and regimented economy designed to secure full employment for the common man at the price of depriving him of all freedom to make economic decisions. Again in both countries the power to make decisions, and the freedom which is an incident of that power, were concentrated in and limited to a small ruling group. In Germany this concentration was ostentatiously vaunted in glorifications of the so-called elite; in Russia less has been said of it, but under both systems the reality of the power has been evidenced by the bitterness with which it has been fought for, and by the assassinations and blood-purges which have gone on amid the privileged ranks of the rulers. Finally in both Russia and Germany these rulers have repeatedly protested that everything they were doing was solely for the public interest and the benefit of the masses, and from the standpoint of their own beliefs and viewpoints there is no reason to doubt their professions.

In what I have said I have not intended to imply that there is in any sense a complete identity between Hitlerism and Russian Communism, or between the Russian system and the new philosophy of government in this country; but it seems clear that in certain respects all three systems embody similar principles of governmental organization, and to this extent, and strictly from the standpoint of governmental principles, the contrast between Hitlerism and our own new governmental philosophy is not so great as might at first be supposed In the light of this, what are we to say of the contention that if other arguments for adopting that philosophy fail to be persuasive, we must nevertheless accept it as the only possible alternative to Hitlerism?

The answer to this question is that the choice which it offers is in fact Hobson's choice The argument implied in the question amounts to saying that in spite of what observation and reason may tell us, in spite of what a rational analysis of alternatives may show, we are nevertheless powerless as a nation to avoid being borne on by resistless forces into some form of governmental absolutism, even though we have no proper grounds for supposing that any good will come of it The argument is fatalistic It recommends passivity on the one hand and an act of faith on the other It invites us to submit ourselves to an irrational course of events and to believe that somehow good will be the final goal of ill It thus reduces political action to the level of the seemingly blind and unconscious processes of nature. It is the argument of Anne Lindbergh in her little book entitled *The Wave of the Future*, where she says

> What is pushing behind Communism? What behind Fascism in Italy? What behind Nazism? Is it nothing but a return to barbarism? Or is some new and perhaps even ultimately good conception of humanity trying to come to birth?[16] I believe that it is in its essence good, but because we are blind we cannot see it[17] Somehow the leaders in Germany, Italy and Russia have discovered how to use new social and economic forces They have sensed the changes and they have exploited them They have felt the wave of the future and they have leaped upon it[18] The wave of the future is coming and there is no fighting it.[19]

That is Mrs. Lindbergh's attitude. Whether it is to be our American attitude is the central question for our philosophy of government today

It is obviously a question which imposes a responsibility on scholars and all who profess to be in any sense versed in the study and analysis of political events. Their responsibility is the greater in that they have done so much toward bringing about the situation which makes the question imperative They have helped unleash the forces which are now demanding to have their way irrespective of whether they can justify their claims. They have provided those forces with many of the tools and techniques which make them formidable The question they must now face is, what is their function as scholars? Is it after all only to act as the servants and instruments of events, and go along with the trend of dominant forces for the sake of being "useful," or do they have a responsibility to consider when and how trends need to be controlled? Do they have a responsibility to develop standards of critical judgment? Is their obligation to apply analysis to political forces and phenomena rather than merely share in, or report them?

If the academic students of law and government in our generation will accept such a responsibility, there is a heavier and more important task before them than fell to the lot of their predecessors Of course the old analysis of Locke and Montesquieu, valid as it still remains in essentials, is no longer adequate Inevitably government must do things today which they did not contemplate Inevitably there must be more regulation Inevitably government must act to some extent through administrative agencies The old analysis is not adequate because it is not complete and necessarily could not envisage many issues with which we are deeply concerned But what we need today is cool dissection, carried on in the spirit of that analysis, of certain kinds of human processes with which or through which government purports to deal.

We need to know, for example, under what circumstances the satisfaction of grievances is likely to generate other grievances We need to know approximately how much disputing and quarreling is consistent with the continued functioning of an organization We need to analyze what factors tend to make the spokesmen of a group intransigeant and non-co-operative We need to know what circumstances are favorable to the emergence and effectiveness of sane and informed leadership We need to inquire what types of activity are appropriate for organizations under strongly centralized control, and what other activities should leave room for differences of opinion and purpose.

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[16] Anne Morrow Lindbergh, *The Wave of the Future* 15, New York, 1940

[17] *Ibid.*, 17

[18] *Ibid.*, 18, 19

[19] *Ibid.*: 37

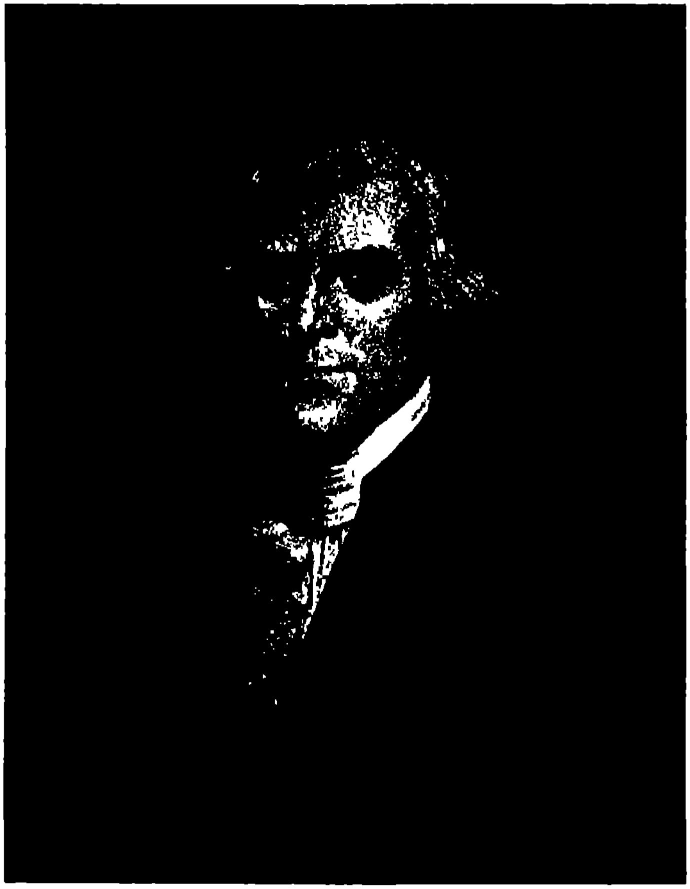
These are some of the problems, although of course by no means the only ones, with which the study of government and politics needs to concern itself if it is to make a fruitful contribution to the conduct of affairs in our time. Clearly such problems cannot be investigated by the methods of natural science or to any considerable extent by statistical techniques They call for a combination of historical analysis with wise and understanding social observation In other words, political philosophy needs to elaborate its own methods rather than attempt to borrow them from elsewhere Doubtless such investigation is less exciting than agitation or participation in the combats and intrigues of practical politics, or even than the reporting of current events However, if it is not carried on, practical politics will to that extent lack an available source of essential knowledge It is perhaps not too much to say that in recent years students of the social sciences have largely misconceived their function in neglecting tasks which they alone can carry on for a supposedly more immediate and practical kind of usefulness which in the long run may not be as valuable to the community

If there is this responsibility on scholars, there is also a responsibility on members of the professions and men of affairs The extent to which these men, and especially the more active and successful among them throughout the country, have lost touch with intellectual movements during the last generation is equalled only by the extent to which they have also lost touch during the same period with public opinion generally, and with the management of the political forces of the times One of the strangest aspects of our unusual political era is that a majority of those who are performing the most important and responsible functions in the general activities of community-life, industrial, financial, social, philanthropic and professional, have little or no influence in the conduct of actual political affairs. This is by no means entirely their own fault, many developments have contributed to it; but to some extent it is their fault, and to that extent they are under a responsibility to bring themselves again in touch, as they once were, with the forces that shape our politics Today this is no easy task It requires on the one hand hard thinking and a certain amount of hard reading in a much broader field than that to which they have accustomed themselves, and it also requires the formation and maintenance of much wider contacts with groups and elements in the community with which they are not ordinarily in the habit of consorting If however, they will not assume this responsibility, keep in training for it, and make whatever sacrifices of time and effort are needed to discharge it, then there is little hope that the irrational tendencies which are abroad in our time can be defeated If these men, who through their energy and their achievements are fitted to be leaders go on as most of them have been going on, if they are too busy to understand and too isolated to act, then there is no alternative to fatalism and surrender. Then Anne Lindbergh is right in saying, "The wave of the future is coming and there is no fighting it"

To speak of fatalism or surrender in the shadow of Independence Hall should be a kind of sacrilege. The pictured lips of the men whose portraits hang across the way would break into voice to denounce it It was something which for all their moderation, learning and wisdom, or perhaps because of their moderation, wisdom and learning they did not understand I have spoken to you tonight of our earlier as well as our later political philosophy, and, as I understand it, the message of that earlier time to our later age is still embodied in Emerson's question,

Of what avail is plough or sail
Or land or life if freedom fail?

PLATE 1a



THOMAS JEFFERSON

Engraved by W Holl

"Under the Superintendance of the Society for the
Diffusion of Useful Knowledge"

JEFFERSON AND THE AMERICAN PHILOSOPHICAL SOCIETY

GILBERT CHINARD
Princeton University

(Read April 22, 1943)

> These [scientific] societies are always in peace, however their nations may be at war Like the republic of letters, they form a great fraternity spreading over the whole earth, and their correspondence is never interrupted by any civilized nation
>
> JEFFERSON TO JOHN HOLLINS
> Washington, February 19, 1809

As A preamble to this paper a word of caution may not be amiss. While the early proceedings of the Society in manuscript form are preserved in the Library and are readily accessible to research workers, it is generally assumed that they have been made available to the general public in the 1883–1885 printing of the well-indexed volume entitled *Early Proceedings of the American Philosophical Society for the Promotion of Useful Knowledge, Compiled by one of the Secretaries, from the Manuscript Minutes of its Meetings from 1744 to 1838* Such is not exactly the case, since a comparison of the printed text with the manuscripts shows that the editor has arbitrarily condensed, abridged, indicated by title, or totally omitted important portions of the minutes The information for the period between 1744 and 1769 is more than sketchy, letters and communications in a foreign language are seldom if ever reproduced, however important may have been the signatories, the names of members present at the meetings are almost never given in full, the editor being generally satisfied with mentioning two or three in whom he happened to be more particularly interested and then indicating the total of members present; gifts made to the Society are scarcely described, and many papers are listed by title Even more unsatisfactory is the publication made in 1819 of the *Transactions of the Historical and Literary Committee of the American Philosophical Society,* in which one would expect to find at least a reasonably complete account of the organization of the committee It is particularly to be regretted that the extensive correspondence between Du Ponceau, secretary of the committee, and Thomas Jefferson still remains unpublished, and more regrettable that the minutes of the committee have never been printed While we were surveying the Universe, we have neglected to explore our own domain and we have remained unaware of the riches preserved in our archives. Even a superficial study of this practically unknown and seldom consulted material would throw a new light on the development of the Society, it would particularly demonstrate the broadness of the interests of our predecessors, their constant preoccupation to keep an uninterrupted correspondence and communication with the world of learning, a truly catholic and cosmopolitan spirit and a praiseworthy ambition to do their share in the diffusion of useful knowledge We may well wonder whether, like charity, history should not begin at home, and whether one of the undertakings to be considered by the Society should not properly be the integral publication of our early archives, with the ultimate aim of promoting the writing of an adequate history of the American Philosophical Society

A complete account of Thomas Jefferson's connection with the Society would constitute one of the capital chapters of this history For 47 years a member of the Society, and for 17 years its President, Thomas Jefferson occupies in the promotion of useful knowledge a place second to none, not even to Benjamin Franklin, our founder The documents discovered in our archives and listed by Mrs Gertrude D Hess, Assistant Librarian of the Society, are so abundant and so significant that a full treatment of the subject would require an extensive and voluminous study as well as an account of the activities of the Society during a long period This paper purports only to be a rapid sketch and a brief survey of a subject deserving a more complete documentation and a more elaborate presentation

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 3, JULY, 1943

Even if the news of the organization in Philadelphia of a society for the promotion of useful knowledge did not reach Virginia at once, we may surmise that Thomas Jefferson had heard of the American Philosophical Society several years before coming to this city as a delegate to the Continental Congress The young Virginia lawyer and planter had early become interested in natural phenomena and in natural philosophy, and by the end of 1733, he had certainly been informed of the existence of the scientific organization founded by the father of American philosophy by his recently arrived friend and neighbor, Philip Mazzei, who, at Franklin's request, had acted in Europe as agent of the American Philosophical Society.

For "weighty reasons" which do not have to be elaborated upon and were not otherwise defined by our predecessors, the meetings of the society from the beginning of 1775 to 1780 were held very irregularly, the records were kept in a haphazard manner, and apparently new members were not always notified of their election To retrace the activities of the Society during these years would require a thorough study of the Philadelphia papers, which occasionally inserted news concerning the meetings of the philosophers

Jefferson's election is a striking case in point It was known that he was elected to membership in 1779, the same year as Gérard, the French plenipotentiary, Rev James Madison of Williamsburg, General Anthony Wayne, and George Washington Such at least was the indication given in the list published in the second volume of the *Transactions*; but the exact date of his election to membership remained uncertain. It happens, however, as discovered by Mrs Hess, that the January 27, 1780, issue of the *Pennsylvania Packet* reported the proceedings of the meeting held on January 21. This official communiqué is of such importance that it deserves to be reprinted in full, for, on that day, a most distinguished array of new members were admitted to the Society.

PHILADELPHIA, January 27.

At a Meeting of the AMERICAN PHILOSOPHICAL SOCIETY, the 21st Inst the following Gentlemen were chosen Members, viz.

His Excellency George Washington, Esq; General and Commander in Chief of the Armies of the United States of North America.

His Excellency the Chevalier De La Luzerne, Minister Plenipotentiary of France.

Monsieur Marbois, Secretary to the Embassy of France.

His Excellency Thomas Jefferson, Esq; Governor of the State of Virginia.

His Excellency John Jay, Esq; Minister of the United States at the Court of Madrid

His Excellency Henry Laurens, Esq; late President of Congress

The Honorable John Adams, Esq, late Member of Congress

The Honorable William Carmichael, Esq; Secretary of the Embassy to the Court of Madrid.

Major General Arthur St. Clair.

Major General Anthony Wayne

Col William Grayson, of the Board of War

Col Hamilton, and Col John Laurens, Aids du Camp to His Excellency General Washington

Baron de Stuben, Inspector General of the American Army

Major Vallancey, Second Engineer of Ireland, and Secretary to the Society of Antiquarians in Dublin.

Timothy Matlack, Esq, Secretary of the Supreme Executive Council of the State of Pennsylvania.

The Rev John C Kuntze, Rector of the German Lutheran Congregation, Philadelphia.

The Rev Mr James Madison, President of William and Mary College, Virginia.

William Churchill Houston, Esq; Professor of Mathematics of Nassau College, and Delegate in Congress for the State of New Jersey

Dr William Brown, of Virginia

Mons. Tournon, Engineer of the Southern Army

And, Robert Erskine, Esq, F R S Geographer of the United States

Perhaps I may be permitted here to pause a moment to explain an otherwise puzzling omission and contradiction in our records. When, in 1793, George Washington was solicited by Jefferson to subscribe to the fund raised for Michaux's expedition, the President answered with the following letter preserved in the Library of Congress:

Philadelphia 22^{d}. Jan. 1793

Dear Sir,

Nothing occurs to me as necessary to be added to the enclosed project.—

If the Subscription is not confined to the members of the Philosophical Society, I would readily add my mite to the means for encouraging M^{r}. Michaud's undertaking—and do authorize you to place me among, & upon a footing with the respectable sums which may be Subscribed.—

I am always
Yours.
G^{o} · WASHINGTON

Thus it happened that, although they were duly elected, William Carmichael, Arthur St. Claie, William Grayson, John Laurens, Baron de Steuben, Major Vallancey, Dr William Brown, William Churchill Houston, Mons. Tournon (who probably was Chevalier de Ternant), and Robert Erskine never appeared on our membership lists, that Timothy Matlack was appointed on February 17, 1780, "to make the annual oration in which thanks should be paid to the Legislature if the pending bill for incorporating the Society were granted," although his previous election to membership is not mentioned anywhere, and that similarly, "Rev^{d} D^{r} Kunzie" became a Secretary on January 2, 1784. It also happened that Henry Laurens had already been elected on April 17, 1772, that John Jay was elected a second time on January 19, 1787, John Adams on January 18, 1793, Alexander Hamilton on January 21, 1791, and that the minutes do not record the election of George Washington, although a letter concerning his election was read at the meeting of June 16, 1780. However, by 1793 the first President of the United States had forgotten his early connection with the Society.

As far as Jefferson was concerned, it is likely that he owed his election not only to his participation in the writing of the Declaration of Independence, and perhaps to the fact that he had just become Governor of Virginia, but also to his reputation as a natural philosopher and to his contributions to science. The minutes of the meeting held on December 17, 1779, record the receipt of letters from the Reverend Mr Madison, President of William and Mary College, containing

> a series of *Meteorological Observations* by His Excellency Governor Jefferson and himself separately, for an year and a half, likewise a set of Experiments on what are called the "sweet springs."—Thanks, and a request for continuance of correspondence.

No request to a new member was ever more scrupulously and more continuously obeyed: the correspondence thus started was to continue for 47 years. On the other hand, if we refer to the *Notes on the State of Virginia,* we shall easily see that this communication did not mark the beginning of Jefferson's scientific collaboration with the Reverend Mr Madison. As early as 1772, he had started exchanging meteorological notes with the president of his alma mater and had begun his observations on the climate of Virginia.

A little over a year later, on January 5, 1781, Governor Jefferson was elected Councillor for two years, with Rev. Mr. Duffield, Governor Livingston, and Dr. Witherspoon. The letter of thanks written by Jefferson on the occasion and not hitherto published is more than a formal and polite acknowledgment. The Governor of Virginia had certainly been pleased and honored, and he expressed for the first time a melancholy regret often found later in his correspondence, a genuine longing for the peaceful pursuits of science and literature in which he was not to be able fully to engage for many years.

Richmond Apr 18 1781

Sir

I beg leave through you to return my most grateful thanks to the American Philosophical society for the honour they have been pleased to confer on me by appointing me one of the Counsellors for that learned corporation. the busy scene in which I have the misfortune to be engaged has kept me too long from acknowledging the receipt of your polite letter notifying this honour to me, and I shall be very happy if the leisure, to which I mean shortly to retire, shall enable me to contribute any thing worthy the acceptance of the society. but too long detached from those objects which come more immediately within their plan, it will scarcely be within my power to recover even the little familiarity I once had with them, and which would be far short of rendering the society any service. I can only assure them that I shall not be wanting in every respect and office which I may have an opportunity of rendering, & yourself that I am with very great respect & esteem Sir

your most obedt
& most humble servt.
Th Jefferson

Indorsed: From his Excy. T Jefferson Read May 4, 1781 Complimentary

For the next two years, no mention of Jefferson appears in the minutes. But on January 3, 1783, he was again elected a Councillor, this time for three years, with Witherspoon, Duffield, and Rittenhouse.

Ten days later, on January 13, 1783, Jefferson moved and Reed seconded that Rittenhouse should make an orrery to be presented to His Most Christian Majesty.

The circumstances leading to this motion are worth considering. In November, 1782, Jefferson had been notified of his appointment as Plenipotentiary, to be associated with Dr Franklin and Mr. Adams in negotiating peace. The next three months were spent in preparing for the voyage. It was only in April that he gave up his project, on hearing that the object of his appointment was so far advanced as to render it unnecessary for him to go to Europe. But aside from his official mission, he obviously had appointed himself a representative and champion of American science and learning, and one of the aims he intended to pursue was to correct the false impression apparently prevailing in Europe despite Franklin's efforts and almost insultingly formulated by Abbé Raynal that "l'Amérique n'a pas encore produit un bon poëte, un habile mathématicien, un seul homme de génie, dans un seul art ou une seule science" Jefferson had just refuted this scornful assertion in his answer to Barbé-Marbois's questionnaire, written during the last illness of his wife and later published as *Notes on the State of Virginia*. But he obviously wanted to take with him to Europe a striking and tangible mark of the scientific genius of America. As Congress had neither the time nor the disposition to pay attention to such matters, Jefferson thought that it belonged to the American Philosophical Society to act on the occasion, non-officially but authoritatively. That his intention was fully understood and fully approved by the King of France, appears from a communication from the French Minister, read on September 26, 1783, informing the Society that "the King would accept the Orrery" and "by his Royal Patronage excite an Emulation between the Literary Societies of France and the United States." I have been unable to discover whether the orrery was ever delivered to Louis XVI, but Jefferson was not a man easily to forget or neglect a matter involving the scientific prestige of his country. When he published the *Notes on the State of Virginia*, he took particular care to recall Rittenhouse's achievement:

> We have supposed Mr. Rittenhouse second to no astronomer living; that in genius he must be the first, because he is self-taught. As an artist he has exhibited as great a proof of mechanical genius as the world has ever produced. He has not indeed made a world; but he has by imitation approached nearer its Maker than any man who has lived from the creation to this day.

Although Abbé Raynal had taken back his remarks, as far as North America was concerned, maintaining them only with respect to the Southern regions, Jefferson added a footnote that was even more assertive than the original text:

> There are various ways of keeping truth out of sight. Mr. Rittenhouse's model of the planetary system has the plagiary appellation of an Orrery; and the quadrant invented by Godfrey, an American also, and with the aid of which the European nations traverse the globe, is called Hadley's quadrant.

The long stay of Jefferson in France, his travels in Europe, his association with the leading scientists and philosophers of the day, did not modify in any appreciable way his opinion on the part that his native country was called upon to play in the world of science and learning. He came back to America more determined than ever to promote the diffusion of knowledge, and to obtain proper recognition for the American luminaries.

The fact that the seat of the government was then in New York explains that no mention of Jefferson's name appears in the minutes of the Society until January 7, 1791, when he was elected third Vice President, after Dr. J Ewing and Dr W. Smith. Among the "new members" elected at the following meeting, on January 21, 1791, were the United States Secretary of the Treasury, Alexander Hamilton, and the Attorney General, Edmund Randolph. Although the Society was not a government institution, it was in a position to work with the government and for the government, and Jefferson was not the man to overlook such an opportunity.

On January 6, 1792, the same officers were reelected, but Jefferson's name appears first among the Vice Presidents. While in Philadelphia, he attended the meetings regularly and faithfully, and on May 18 Dr Barton read "a Botanical Description of the *Podophyllum dyphyllum*, now called *Jeffersonia Virginica*."

On January 4, 1793, the same officers were reelected, and on January 18 Vice President John Adams was "elected to membership," the officers of the Society apparently remaining ignorant of his previous election in 1780.

During this year, and for the second time, Jefferson was to make use of his connection with the Society to promote an enterprise of great public interest which, for obvious reasons, the government could not undertake.

This is not the place to give a detailed account of André Michaux's intended journey across the continent to Sitka; how Jefferson started a subscription among the members of the Society, drew up instructions for Michaux, and, ten years before the Lewis and Clark Expedition, had already mapped out the project of a "literary enterprise" which was not without some political implications.

On January 3, 1794, Jefferson was reelected

Vice President, but as he had already retired from public life and lived at Monticello, his mind "totally absorbed by his rural occupations," he did not attend any meeting.

On January 2, 1795, his name was dropped from the list of officers of the Society. He had not forgotten his Philadelphia friends, however, for the following year, on July 3, 1796, unaware of his friend's recent death, he wrote to Rittenhouse, to inform him of the discovery, beyond the Blue Mountains in Virginia, of fossil remains "appearing to be of the Tyger-lion and Panther species."

On January 6, 1797, his colleagues, having every reason to believe that the newly elected Vice President of the United States would be able to attend their meetings and to take an active part in the work of the Society, elected him President of the American Philosophical Society, to succeed Rittenhouse, deceased. I shall omit here the letter of the Secretaries Samuel Magaw, Jonathan Williams, William Barton, and John Bleakley, notifying him of his election. Jefferson's answer, on the other hand, although several times printed, must be quoted in full, for it expresses his belief in the essential mission and function of the Society as he understood it:

Monticello, Jany 28th, 1797

Gentlemen,

I have duly received your favour of the 7th instant, informing me, that the American Philosophical Society have been pleased to name me their President. The suffrage of a body which comprehends whatever the American World has of distinction in Philosophy & Science in general, is the most flattering incident of my life, and that to which I am the most sensible. My satisfaction would be complete, were it not for the consciousness that it is far beyond my titles. I feel no qualification for this distinguished Post, but a sincere zeal for all the Objects of our institution, and an ardent desire to see knowledge so disseminated through the mass of mankind, that it may at length reach the extremes of Society, beggars, and kings.—I pray you, Gentlemen, to testify for me, to our body my sense of their favour, and my dispositions to supply by zeal what I may be deficient in the other qualifications proper for their service, and to be assured that your testimony cannot go beyond my feelings.

Permit me to avail myself of this opportunity of expressing the sincere Grief I feel for the loss of our beloved Rittenhouse. Genius, Science, modesty, purity of morals, simplicity of manners, marked him one of Nature's best samples of the Perfection she can cover under the human form. Surely, no Society, till ours, within the same compass of time, ever had to deplore the loss of two such members as Franklin & Rittenhouse. Franklin, our Patriarch, whom Philosophy & Philanthropy announced the first of men, and whose name will be like a star of the first magnitude in the firmament of heaven, when the memory of those who have surrounded & obscured him, will be lost in the Abyss of time

With the most affectionate attachment to their memory, and with sentiments of the highest Respect to the Society, and to yourselves personally, I have the Honour to be,

Gentlemen
Your most obedient
and most humble Servant
Th Jefferson

For seventeen years he was to be regularly reelected, and until the day of his death his interest in the work of the Society never lagged. Of his definite contribution to the activities of the Society during these years no detailed account can be given here. For the present at least I shall limit myself to the externals.

When the seat of the government was transferred to Washington, Jefferson considered that his usefulness to the Society had come to an end, but after offering his resignation, which was declined, he accepted his reelection with an obvious pleasure. On January 25, 1801, he wrote to the Secretaries:

> I had believed the interests of the society would have been better consulted by the appointment of a President more at hand to perform the duties of his station, and had taken the liberty to express that opinion in a letter to one of the respectable vice presidents they have decided on a different course, and have imposed on me a higher obligation by an attention to such services as may be rendered in absence, to make up for those which that absence prevents.

Again in 1808 he expressed his strong disinclination to continue in office when he was about to retire from public life:

Washington, Nov. 30, 08.

Being to remove within a few months from my present residence to one still more distant from the seat of the meetings of the American Philosophical Society, I feel it a duty no longer to obstruct it's service, by keeping from it's chair members whose position, as well as qualifications, may enable them to discharge it's duties with so much more effect, begging leave therefore to withdraw from the Presidency of the Society, at the close of the present term, I avail myself of the occasion gratefully to return my thanks to the Socy for the repeated proofs they have been pleased to give of their favor, and confidence in me, and to assure them, in retiring from the honourable station in which they have been pleased so long to continue me, that I carry with me all the sentiments of an affectionate member, & faithful servant of the Society

Asking the favor of you to make this communication to the Society I beg leave to tender to each of you personally the assurances of my great esteem and respect.

TH. JEFFERSON

The Vice-presidents of the American Philosophical society

Thereupon, at the meeting of December 16, 1808, the letter was "ordered on the minutes," but the Society refused acting upon it, and on January 6, 1809, Jefferson was duly reelected President

Year after year until 1814, he accepted his reelection in the same graceful manner The time came, however, when he had to limit his activities and his responsibilities On November 23, 1814, he presented to the Society his final resignation·

Monticello, Nov 23, 14

Sir

I sollicited on a former occasion permission from the American Philosophical society to retire from the honor of their chair, under a consciousness that distance as well as other circumstances denied me the power of executing the duties of the station, and that those on whom they devolved were best entitled to the honors they confer. it was the pleasure of the society at that time that I should remain in their service, and they have continued since to renew the same marks of their partiality of these I have been ever duly sensible and now beg leave to return my thanks for them with humble gratitude still I have never ceased, nor can I cease to feel, that I am holding honors without yielding requital, and justly belonging to others. as the period of election is now therefore approaching, I take the occasion of begging to be withdrawn from the attention of the Society at their ensuing choice, and to be permitted now to resign the office of President into their hands, which I hereby do. I shall consider myself sufficiently honored in remaining a private member of their body, and shall ever avail myself with zeal of every occasion which may occur of being useful to them, retaining indelibly a profound sense of their past favors.

Although then, as in 1808, the Society refused to take any action on the letter, at the annual meeting the wishes of Jefferson were complied with, and Caspar Wistar was elected as his successor. On January 20, 1815, a letter to Jefferson was approved to inform him of the vote, and to solicit from him "the continuance of the friendly attentions which you have always shown to their interests" It was acknowledged on February 8, in a typically Jeffersonian manner:

Monticello Feb. 8 15

Sir

I am honored with your letter of Jan 20 conveying to me the flattering sentiments which the American Philosophical Society have condescended, through you to express on my resignation of the office of President, in which they had been pleased so long to continue me. I receive them with equal sensibility and gratitude the motives for withdrawing from a station the duties of which could not, in my situation, be fulfilled, were truly expressed in my letter of Nov. 23 they had been conscientiously felt when, on a former occasion, I asked a like permission, and so continued to be· and I trust it is seen that I have rendered a service in giving occasion for the choice of a successor so eminently meriting the honor, so fully equal to it's duties, and in place to perform them. In retaining still the character of a member of the society, I am gratified by the idea of a continued fellowship with them, and shall never be more so than on occasions of being useful to them

Praying you to present them the homage of my dutiful respects, permit me also to add my obligations to yourself personally for the friendly terms in which you are pleased to make their communication, and accept the assurance of my great consideration and esteem.

TH· JEFFERSON

So much for the official record, but there is no doubt that there was more than appears on the surface, and that the question of Jefferson's successor in the presidency had been for some time a bone of contention not easily to be disposed of. This appears clearly in letters written by Jefferson to Correa de Serra and to John Vaughan.

To Correa he had written, on December 27, 1814.

You will have seen that I resigned the chair of the American Philosophical Society, not awaiting your further information as to the settlement of the general opinion on a successor without schism I did it because the term of election was too near to admit further delay.

To John Vaughan, after the election of Caspar Wistar, he wrote no less significantly:

My desire to do so had been so long known to every member, and the continuance of it to some, that I did not suppose it can be misunderstood by the public Setting aside the consideration of distance, which must be obvious to all, nothing is more incumbent on the old, than to know when they should get out of the way, and relinquish to younger successors the honors they can no longer earn, and the duties they can no longer perform I rejoice in the election of Dr Wistar, and trust that his senior standing in the society will have been considered as a fair motive of preference of those whose merits, standing alone, would have justly entitled them to the honor, and who, as juniors, according to the course of nature, may still expect their turn

The full story of Jefferson's final resignation cannot be written until the manuscripts, stored away in a safe place for the duration of the war, are again accessible It is not difficult, however, to read between the lines, and it seems that our predecessors were not entirely devoid of human weaknesses and ambitions Besides any other consideration, Jefferson's continuous reelection must have appeared to the elder statesmen of the Society as the most convenient way to prevent a contest which would have disrupted the good harmony of the meetings and divided the membership into several camps

This exchange of letters did not mark the end of Jefferson's connection with the directing board of the Society On January 5, 1818, Du Ponceau wrote him that, at the election held on Friday last, the members of the Society

have done themselves honor by placing you at the head of the List of their Counsellors. In doing so they had no wish but to let the world know that you are still willing to be their guide and adviser, to excite confidence, and preserve the respect which it has acquired by being presided by such men as Franklin, Rittenhouse & yourself

The letter of thanks written by Jefferson to Robert Patterson, First Vice President of the Society, acting as President owing to the recent death of Wistar, was more than a polite acknowledgment Even in his retreat, the Sage of Monticello did not remain indifferent to the friendly marks of affection bestowed upon him by his old associates.

Monticello Feb. 15, 18.

Dear Sir

I have to acknolege the reciept of your favor of Jan. 23. informing me that the Am. Philosophical society have done me the honor of naming me one of the Counsellors of that institution if, at this distance, I can be useful to the society in any form, I ask nothing but the occasion of proving to them my readiness and zeal; and I beg the favor of you, Sir, to be the channel of conveying to them my renewed thanks for this and all other the [*sic*] marks of their favor for which I have so long and so often been indebted to them to these permit me to add sincere condolances on the loss they have sustained in the death of our president, whose character was an ornament to our society, and his science precious to our country. I tender to yourself, Sir, the assurance of my great esteem and respect

Th Jefferson

Doct^r R. M Patterson

On January 5, 1821, the Society paid the same tribute to Jefferson by making him again Councillor with Maclure, Collin, and Meredith, and for the last time reelected him, to the same office, with the same colleagues, on January 2, 1824

This honor had come to Jefferson not only in recognition of his past services, but even more for his continued interest in the work of the Society and for his recent and important contributions Without unduly trespassing on Dr Stoussat's province, I may be permitted to recall Jefferson's participation in the organization of the Historical and Literary Committee of the American Philosophical Society

"To you, Sir," wrote Du Ponceau on November 14, 1815, "the first thoughts of a friend to American Science & Literature are naturally turned, and independent of my individual feelings, I am satisfied that I am acting in conformity with the wishes of the Committee by paying you this first tribute of respect"

In fact, the "Seventh Committee" of the Society, established on March 17, 1815, "to be denominated *the Committee of History, Moral Science, and General Literature*," was simply an extension and a revival of a committee organized by Jefferson, as one of the very first acts of his presidency At the first meeting over which he presided, on May 19, 1797, was considered *"A plan for collecting information respecting the Antiquities of N A.*, to be reported by Turner, Wistar, Collin, R P Smith and Seybert." For reasons not mentioned in the minutes, the report was several times referred to the committee or laid on the table. On April 6, 1798, almost a year later, the second report on the plan for collecting information relative to American antiquities was read, paragraph by paragraph, amended, and the following committee was appointed. Jefferson, Turner, Wistar, Seybert, Peale, Wilkinson, Williams. At the end of the same year the Committee presented a formal report on its activities (*Early Proceedings*, 274). The report stated that "The first object of the Committee was to invite communications from distant places & with that view the annexed Circular Letter has been extensively distributed." The full text of the "Circular" was also printed on page xxxvii of the fourth volume of the *Transactions*, published in 1799. As it seems to have been generally overlooked, even when the "Historical and Literary Committee" of 1815 was organized, I may be permitted to reprint it here. The program as well as the accompanying considerations certainly ought to mark a date in the history of the Society:

> The American Philosophical Society have always considered the antiquity, changes, and present state of their own country as primary objects of their research, and with a view to facilitate such discoveries, a permanent committee has been established, among whose duties the following have been recommended as requiring particular attention.
>
> 1. To procure one or more entire skeletons of the Mammoth, so called, and of such other unknown animals as either have been, or hereafter may be discovered in America.
> 2. To obtain accurate plans, drawings and description of whatever is interesting, (where the originals cannot be had) and especially of ancient Fortifications, Tumuli, and other Indian works of art; ascertaining the materials composing them, their contents, the purposes for which they were probably designed, &c.
> 3. To invite researches into the Natural History of the Earth, the changes it has undergone as to Mountains, Lakes, Rivers, Prairies, &c.
> 4. To inquire into the Customs, Manners, Languages and Character of the Indian nations, ancient and modern, and their migrations.
>
> The importance of these objects will be acknowledged by every Lover of Science, and, we trust, sufficiently apologize for thus troubling you: for without the aid of gentlemen who have taste and opportunity for such researches, our means would be very confined. We therefore solicit your communications, now or in future, on these subjects; which will be at all times thankfully received, and duly noticed in the publications of the Society.
>
> As to the first object, the committee suggest to Gentlemen who may be in the way of inquiries of that kind, that the Great Bone Lick on the Ohio, and other places where there may be mineral salt, are the most eligible spots for the purpose; because animals are known to resort to such places.
>
> With respect to the second head, the committee are desirous that cuts in various directions may be made into many of the Tumuli, to ascertain their contents; while the diameter of the largest tree growing thereon, the number of its annulars and the species of the tree, may tend to give some idea of their antiquity. If the works should be found to be of Masonry; the length, breadth, and height of the walls ought to be carefully measured, the form and nature of the stones described, and specimens of both the cement and stones sent to the committee.
>
> The best methods of obtaining information on the other subjects will naturally suggest themselves to you, and we rely on a disposition favourable to our wishes.

The letter was signed by Thomas Jefferson, President of the American Philosophical Society, at Monticello in Virginia, James Wilkinson, Commander of the Army at Head Quarters; George Turner, of the Western Territory, near Cincinnati, Dr. Caspar Wistar, Vice President of the A. P. S.; Dr. Adam Seybert, Secretary of do; C. W. Peale; and Jon. Williams, the latter ones all of Philadelphia.

Unless I am much mistaken, this document inspired by Jefferson, and in which the Jeffersonian touch is easily recognized, constitutes the charter of American ethnology, and as such would deserve to be better known.[1]

Jefferson was too considerate of his friend's feelings, and too indifferent to his own achievements, to remind Du Ponceau of the early organization of a defunct committee. On January 22, 1816, he wrote him a letter containing a complete program of the work to be undertaken by the new committee, promising at the same time his full cooperation:

> I have always thought that we were too much confined *in practice* to the Natural and Mathematical departments. this Committee will become a depository for many original MS many loose sheets of no use by themselves and in the hands of the holders; but of great value when brought into a general depot, open to the use of the future historian or literary inquirer. I shall be very happy in contributing to the usefulness of your establishment by any thing in my possession, or within the reach of my endeavors; and I begin by enclosing you a geographical and statistical account in MS. of the Creek or Muscogee

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[1] One should note that the circular is quoted in part and discussed by Dr Clark Wissler, in his article on "The American Indian and the American Philosophical Society" (*Proc. Am. Philos. Soc.* 86 (1): 189, 1942). But the author does not seem to have noticed the part played by Jefferson in the organization of the committee.

> Indians and country, as it was in the years 98. and 99. this was written by Colo. Hawkins who has lived among them as agent now upwards of 20 years. . . I think it probable I may find other things on my shelves, or among my papers, worth preserving with you, and will with pleasure forward them from time to time, as I lay my hands upon them.

He also promised to attempt to trace the manuscript journal of the Commissioners of 1728 on the North Carolina boundary which was in the possession of the Westover family and written by one of their ancestors, Dr. Byrd

This marked the beginning of a series of letters fully deserving publication and now preserved in our archives, most of them accompanying gifts of precious documents dealing with American history, Indian vocabularies, and geographical descriptions, and culminating with the presentation to the American Philosophical Society of the papers concerning the Lewis and Clark Expedition.

No wonder that in the first volume of the *Transactions of the Historical and Literary Committee*, published in 1819, a special tribute was paid to Jefferson:

> Among those enlightened and truly patriotic citizens, they beg leave, in the first place, to name the late President of this Society, THOMAS JEFFERSON. From the first establishment of this committee, he was pleased to honour us with his valuable correspondence, and has spared no exertions to forward the objects of our institution. To him we are indebted for many important MSS. documents, calculated to throw light on the history of our country, on the customs, manners, and languages of the Indian nations, and various other interesting national subjects. He has lately directed to be placed in our hands several as yet unedited MSS volumes of scientific notes and observations by Messrs. Lewis and Clarke, made in the course of their journey to the Pacific Ocean,

In addition, among the gifts received by the committee, were listed no less than 11 important manuscripts dealings with Indian vocabularies and compiled by Jefferson or annotated by him

Perhaps this would be the place to pause in order to enumerate the gifts of Jefferson to the Society. This, however, has already been done in part in papers read at a preceding meeting, and more information on the subject will certainly be given in papers to be read at this meeting.[8] Such a list would be indicative both of Jefferson's generosity and of the wide range of his interests. Geological and paleontological specimens, including bones of the famous mammoth, "150 pieces of Roman coins in bronze" and coins from Denmark, a "bathometer, just received from the inventor, believing it cannot be otherwise as well disposed," innumerable pamphlets discovered when he was "to the elbows in the dust of his book shelves," books of all sorts, including "a single copy remaining of the Notes on Virginia of the edition printed in Paris" and "the only one perfectly correct"—those are just a few items culled out from his unpublished correspondence with Caspar Wistar, Benjamin Barton, Robert Patterson, John and Benjamin Vaughan, Du Ponceau, and Duflef, preserved in our archives. He was no less active in soliciting gifts for the Society: he seems to have been operative in having the Houdon bust of Condorcet presented to the Society by his former secretary and faithful friend, William Short. He never failed to communicate to the secretaries scientific news of importance, to consult his colleagues on the value of inventions proposed to the government, for at all times he was eager to have the Society supplement the work of the official agencies Publicly at least, and in writing, he never expressed any criticism of his associates, even if as a presiding officer he had to listen patiently to papers of indifferent quality. I should, however, note one exception writing to William Wirt, on August 5, 1815, he gave vent to his feelings in a petulant manner, indicating how he must have suffered at times, during "these weekly assemblages of science"

> Landon Carter's measure you may take from the first volume of the American Philosophical transactions, where he has one or more long papers on the weavil, and perhaps other subjects. His speeches, like his writings, were dull, vapid, verbose, egotistical, smooth as the lullaby of the nurse, and commanding, like that, the repose only of the hearer

On the two papers published by Jefferson in the fourth volume of the TRANSACTIONS, I shall offer little comment. I have already called attention to the letter to Sir John Sinclair, printed at the end of the "Description of the Mould-Board,"[8] and Dr M L. Wilson has discussed at length the technical part of it in his paper on "Thomas Jefferson—Farmer," read at the Annual General Meeting on April 22. The "Memoir on the Discovery of certain Bones of a Quadruped of the Clawed Kind in the Western Parts of Virginia" has been critically analyzed by Dr George Gaylord Simpson, in the paper already mentioned and printed in volume 86 of the PROCEEDINGS One minor addition may be made to the *List of Papers and Books in the Society's Publications,* printed in 1940. It is a short letter dated from Monticello, July 3, 1796, and in which Jefferson discussed the methods for calculating the altitude of the mountains of the Blue Ridge It will be found in volume 4 (p 222) of the TRANSACTIONS

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[8] *Cf.* particularly the paper of Dr. Wissler, already mentioned, for the linguistic manuscripts and Jefferson's interest in linguistics, and George Gaylord Simpson's paper on "The Beginnings of Vertebrate Paleontology in North America" (*Proc. Am. Philos. Soc.* 86 (1) 130-188, 1942) In a paper published in the same volume (p. 29), Dr. William J Humphreys just mentioned "Farmer Jefferson whose private weather diaries are both interesting and valuable."

We must now come to the last part of this rapid survey On July 8, 1826, seventeen members of the Society, with Du Ponceau in the chair, assembled in the hall of the Philosophical Society, and on Dr Patterson's motion unanimously adopted the following resolutions.

Resolved, That this Society, in common with the American Nation, and the whole learned world, is impressed with the deepest regret for the loss of their late illustrious associate and former President, Thomas Jefferson.

Resolved, That the President's chair, which for a great number of years he so honorably filled, be clothed in black for the space of six months.

Resolved, That, according to the ancient usage of this Society in relation to their deceased presidents, a public discourse in commemoration of Thomas Jefferson be delivered by a member, to be appointed for that purpose.

Resolved, That a letter expressive of the feelings of this Society on this mournful occasion be addressed to the family of Thomas Jefferson, and sent to them, together with a certified copy of these proceedings. That the said letter be signed by the officer presiding at this meeting, aud by the now acting Secretary

Resolved, That a letter be written in like manner, to the Royal Academy of Inscriptions and Belles Letteres, at Paris, of which Thomas Jefferson was a member, informing them of the death of their illustrious associate, and expressing at the same time, the regret of this Society for his loss.

Thereupon Nicholas Biddle, Esq., was chosen as orator, and similar resolutions were passed upon the death of John Adams, with request to communicate them to the family of "their illustrious associate" and to "the American Academy of Arts and Sciences at Boston."

The Academy "at Boston" was the first to acknowledge the communication of the American Philosophical Society On July 22, 1826, Edward Everett wrote to the members of the Society a letter in his best style, thanking them for the resolution on the death of John Adams, and at the same time paying a handsome tribute to Thomas Jefferson As it has never been printed in our PROCEEDINGS, it is given here in full.

Gentlemen,

The American Academy of Arts and Sciences has received, with great sensibility, the communication of the 11th inst. made by you, on behalf of the Philosophical Society of Philadelphia, upon the occasion of the decease of our late Venerable Associate, John Adams The Fellows of the Academy gratefully acknowledge the humane attention of the Philosophical Society, in their expressions of sympathy with the Academy, on the removal of one, who had sustained the most honorable relations to his Country, not less as a Scholar, than as a Patriot and Statesman; and of whom the American Academy was for many years permitted to boast, as its presiding Officer.—From the various testimonies of respect paid to his memory, the Fellows of the Academy derive the pleasing assurance, that his loss is felt not less abroad than at home, and from no quarter could a more valuable tribute be received to the services and character of our departed President, than from the learned and distinguished body, which you so worthily represent.

In returning you these acknowledgements of the American Academy, I have it in charge to tender to you its sincere and profound sympathy, in the emotions of astonishment and sorrow, with which the Philosophical Society must be affected, at the dispensation of Providence, by which, on the same day that removed our late venerable President, an associate of your body; the Philosophical Society was, in like afflicting manner, deprived of the illustrious Thomas Jefferson, long the President of your Institution, and an Associate of Ours.—We regard it as not the least affecting of the coincidences, which have forever signalized in History the Day of their United departure, that it should have deprived each of these Institutions respectively of an honored member and Head. The Academy is anxious to convey to the Philosophical Society the Assurance of its respect for the Memory of this distinguished ornament of his Country, their late President; and cannot but deem it a source of consolation and just pride to the two Institutions, as to the literary public of the United States, that the illustrious men whom we deplore, and whose political services had given them successively the first place in the Civil Administration of the Country, should also have been called, by universal acknowledgement of merit, to the head of its two most Ancient and respectable Academic Institutions.—

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[8] The American Philosophical Society and the World of Science. *Proceedings* 87 (1), 1943.

Be pleased Gentlemen to accept the Assurance of my consideration and respect.

Boston 22nd July—1826
By Order,
Edward Everett
Corresponding Secretary of
The American Academy of Arts
& Sciences

Addressed
Peter S Duponceau Esq Vice Presid^{t} }
R Walsh Ju^{r} Esq Secretary }
of the American Philosophical Society

Endorsed Am^{n} Academy E. Everett Boston 22 July Sey read 18 Aug 1826

acknow'm^{t} of our letter of Condolence on Death of *Jn* Adams

During the ensuing months many orations were delivered throughout the country, and the orators did not fail to mark the fateful coincidence through which the two old friends, who after getting estranged had finally renewed their philosophical correspondence, were united in death. Very few of them are worth remembering and reading today, with two remarkable exceptions. William Wirt's eulogy, delivered on October 19, 1826, in the Hall of the House of Representatives, was a thoughtful and eloquent tribute of the nation to the departed Revolutionary heroes. But while most orators discussed the services rendered by Jefferson to his country as a statesman and an educator, Samuel L. Mitchill, speaking by request before the New York Lyceum of Natural History, on the 11th of October, 1826, was practically the only orator to deal adequately with the services rendered to science and learning in the United States by the former President of the American Philosophical Society. His address was properly entitled "A Discourse on the Character and Services of Thomas Jefferson, more especially as a promoter of Natural and Physical Science." A natural philosopher of no mean distinction in his own right, Dr. Mitchill was fully qualified to pass judgment on the scientific achievement of his fellow philosopher. Contrary to the ordinary eulogists, he did not hesitate to indicate the limitations, the errors, and the amateurishness of some of the views of Jefferson. Speaking of the famous *Megalonyx*, Mitchill frankly admitted:

> The author endeavours to prove, by ingenious estimates and venatorial narrations, that the former owner belonged to the Lion-family, but was more than three times as large as the lion. Some of the adventures of the early settlers are told with so much spirit and taste, as with all their seriousness, to impress the mind with the stories of bewitching fiction.

He was equally critical of some boastful affirmations in the *Notes of Virginia*, and gently but firmly pointed out that when Jefferson spoke of the Natural Bridge as

> "the most sublime of nature's works," he certainly forgot the mountains of Kimmalaya [*sic*] in Tibet, the stormy ocean, the sun and his accompaniment of planets, and the starry firmament at night.

This objectivity and these reservations, so rare in eulogies, his unreserved praise on the other hand of what was best in the work of Jefferson, his personal acquaintance with the subject of his discourse, would make Dr. Mitchill's eulogy well worth reprinting today, as probably the best, most complete, and most judicious estimate, written by any of his contemporaries, of Thomas Jefferson as a scientist.

The official "eulogium" delivered on the eleventh day of April, 1827, before the president and members of the Philosophical Society, belongs in a different class. In eloquence and emotion it cannot compare with the speech of Wirt, and although Biddle had much information at his command, his chronology is far from being faultless. Despite these reservations, the address of the orator selected by the Society is not negligible. Well aware of his limitations, Biddle wisely adopted a pedestrian style. He marked well the paramount interests of Jefferson and noted that, in the opinion of the Sage of Monticello, "the highest studies are those which advance man's moral dignity and improve his intellectual and physical condition." Hence Jefferson's comparative neglect of metaphysics and the purely theoretical sciences. The orator also noted the ironic character of Jefferson's destiny which makes him so difficult a subject for biographers to study. "The whole of my life," said he to a friend, "has been at war with my natural tastes, feelings and wishes. Circumstances have led me along the path I have trodden, and like a bow bent I resume with delight the character and pursuits for which nature designed me."

Less original was Biddle's peroration. A well-read man, he was acquainted with Chateaubriand's *Voyage en Amérique*, just published in Paris There he had found a splendid parallel between Bonaparte, the destroyer, and Washington, the builder The temptation was too great to be resisted, and, in his comparison between Napoleon, the emperor of a great nation, and Jefferson, the chief magistrate of a free people, the American orator borrowed too freely and too obviously from the French writer

In the course of his address, Biddle had recalled the fact that, among the distinctions Jefferson had received from foreign nations, he held in particular esteem his title of associate member of the Institute On December 26, 1802, he had been assigned to Class II, in which he counted many friends, among them Destutt de Tracy, and he had bitterly resented Napoleon's decree suppressing the Second Class and merging it with l'Académie des Inscriptions et Belles-Lettres, thereby limiting the activity of its members to ancient literature and history The Bourbon restoration had preserved and enforced these restrictions, but the Académie des Inscriptions still harbored a few irreducible and unreconstructed Idéologues, now gagged and powerless, still standing as the last disciples of the eighteenth-century philosophers and of the best tradition of the French Revolution To them Jefferson was still the man who had written the Declaration of Independence, and above all the man who was responsible for the "revolution of 1800" which had firmly established a democratic form of government in America In these days of suppression, repression, and reaction, the Sage of Monticello appeared as a Plutarchian hero, as the champion of self-government, as the wise statesman who had never given up his faith in the ultimate triumph of democracy, as the counsellor and adviser of all the European liberals by whom his letters were circulated and read, "as were the letters of the apostles in the circles of the first Christians." Jefferson belonged to so many foreign societies that he had lost count of them. In 1817 he had written to Delaplaine, who had asked him for some particulars to be inserted in a biographical sketch.

> I could not readily make a statement of the literary societies of which I am a member, they are many and would be long to enumerate and would savor too much of vanity and pedantry. Would it not be better to say merely that I am a member of many literary societies in Europe and America.

It is significant that of all these "literary societies," the French Academy was the only one to be officially notified by the American Philosophical Society of the death of their former president.

In transmitting the letter of Du Ponceau to the Secrétaire perpétuel, M Dacier, the American Minister, James Brown, did not fail to emphasize the virtues and talents of the "American Statesman and Patriot" It was an opportunity not to be overlooked to make the magic and forbidden words of "Liberty and Independence" ring again through the halls of the Palais Mazarin But if he had hoped to awaken an echo, he must have been disappointed Whatever may have been the feelings of the Academy, the Secrétaire perpétuel could not respond in kind. His letter is given here in the original as a significant document of the times, to be read between the lines, and expressing the nostalgic regret of an old man remembering the last days of the old regime, when John Adams, Abbé Mably, and several others could meet at the house of Madame Helvétius, and freely discuss with Jefferson the fundamental principles of the republican form of government

Institut de France
Académie Royale des Inscriptions et belles-lettres

Paris le 23 Aout 1826

Le Secretaire perpétuel de l'Académie

Monsieur Le Président,

J'ai communique aujourd'hui à L'Académie la Lettre que vous m'avez fait l'honneur de m'écrire pour m'annoncer la perte douloureuse que nous venons de faire par la mort de M Jefferson. L'académie a appris cette nouvelle avec une véritable douleur; Elle se trouve privée de l'un de ses Membres les plus honorables, justement célèbre par les éminents services qu'il a rendus à sa patrie & à L'humanité Je partage d'autant plus vivement cette douleur, que j'ai eu l'honneur de connaitre personellement M Jefferson pendant son séjour à Paris, & L'avantage d'apprécier, par des Relations très fréquentes, les hautes * * * * qui le distinguaient. M Adams & L'Abbé de Mably étaient intimement mêlés à ces relations, & tous ces noms me rappellent des pertes à jamais regrettables pour tous les hommes de bien. Veuillez, Monsieur Le président, assurer à la société philosophique qu'aucune Compagnie ne s'associe plus particulièrement à sa douleur, dans cette occasion, que l'académie des Inscriptions & Belles Lettres, &

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* One word obviously left unwritten, probably "qualités," or "vertus."

agréer l'assurance de la très haute Considération avec laquelle j'ai l'honneur d'être,

Monsieur Le président

Votre très humble & très obéissant Serviteur,

DACIER

Endorsed· Paris Aug 1826 Institut of France Dacier Sec with the Correspondence of Ja^s Brown Min^r US to France Condolance on Death of M^r Jefferson read

The same nostalgic regret appears in the "Éloge de Thomas Jefferson, ancien President des Etats-Unis de l'Amérique du Nord, Membre honoraire de la Sociéte Linnéenne de Paris," delivered before the members of the society by Mr Charles Lemesle, and printed in the fifth volume of the *Mémoires de la Société* in 1827 Unable to discuss openly the political life of Jefferson, Lemesle had recalled the tribute paid by Baron Cuvier in the fifth volume of his great work, not to Jefferson the paleontologist and the author of the memoir on the *Megalonyx*, but to

> the former President of the United States, whose virtues and talents have done so much for the happiness of the people who had chosen him as their leader, who has won the admiration of all the friends of mankind and in whom these superior qualities were combined with an enlightened love for the sciences and a broad knowledge of scientific subjects to which he has made notable contributions [8]

But if Lemesle could only mention Jefferson's "amour de la patrie et amour de la liberté," he was at least free to praise "the American patriot" for his scientific achievements He recalled particularly that he had presented a magnificent collection of fossils to the "classe des sciences mathématiques et physiques de l'Institut de France," that he had sent to the Société d'Agriculture de Paris, of which he was a member, the model of his mould-board, that he had kept up a regular correspondence with many scientific societies, in his own country and in Europe, and had most generously assisted in his distress the refugee scientist Joseph Priestley.

Thus, as a member of the Philosophical Society as well as an individual, Jefferson followed in the steps of the great Benjamin Franklin Perhaps more eager than Franklin to make America independent of European science, and in the words of Du Ponceau, "to convince the world that the true, full and correct knowledge of America can only be obtained in and from America," he combined with this intense patriotism an ardent faith in the universality of knowledge transcending all human frontiers. No less than Franklin, he contributed toward obtaining recognition for the Society abroad. His connections with the French scientific societies have already been noted His prestige in England would deserve a separate study Two marking incidents may be mentioned here The first is a letter dated from London Albemarle Street, 1st June, 1800, written by Rumford in behalf of the Royal Institution of Great Britain, proposing to establish a regular correspondence with the American Philosophical Society, and

> to cooperate with them in all things that may contribute to the Advancement of Science, and to the general Diffusion of the Knowledge of such new and useful Discoveries, and mechanical Improvements, as may tend to increase the Enjoyments and promote the Industry, Happiness, and Prosperity of Mankind

No less striking was the tribute paid to Jefferson by the Society for Promoting the Diffusion of Useful Knowledge, established in London in 1835 by Brougham and John Russell, when they marked their connection with our Society by printing, and having distributed under their "superintendance," an engraving by Holl from the portrait of Desnoyers, engraved and published in France shortly before by Dequauvillers.

Many expressions of this international spirit of science may be found in Jefferson's letters Nowhere has he defined it more vividly than in the letter he wrote to John Hollins of Baltimore, in 1809. He recalled that General Washington had not hesitated to import seeds from Europe and did not conceal the fact that, at the time of the embargo, he had sent to the Agricultural Society of London, at their request, "two or three barrels of genuine wheat of Virginia" How crushingly he reminded those who accused him of lacking in patriotism that

> The last year, the Agricultural Society of Paris, of which I am a member, having had a plough presented to them, which, on trial with a graduated in-

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[8] M. Jefferson, ancien président des Etats-Unis, dont les vertus et les talents ont fait le bonheur des peuples qu'il gouvernait et l'admiration des amis de l'humanité, et qui joint à ces qualités supérieures un amour éclairé et une connaissance étendue des sciences auxquelles il a procuré de notables accroissements.

This was essentially the statement prefacing Cuvier's article, "Sur le Mégalonix," published for the first time in the *Annales du Muséum d'Histoire Naturelle* 5 358, 1804.

> strument, did equal work with half the force of their best ploughs, they thought it would be a benefit to mankind to communicate it They accordingly sent one to me, with a view of its being made known here, and they sent one to the Duke of Bedford also, who is one of their members, to be made use of in England, although the two nations were at war

For he was convinced that inventions and discoveries are the fruition of many hypotheses and experiments, that, as he wrote to John Vaughan on June 28, 1803, "from the variety of witnesses to the same fact we derive a more satisfactory idea of it than from a more handsome statement by a single one" He was convinced that science should know no frontier, that it is essentially a co-operative undertaking, that through the diffusion and promotion of knowledge would ultimately be built the city of man on this earth, an ideal expressed in the motto of our Society, much more explicitly when quoted in full than in its abbreviated form

> *Tros Rutulusve fuat nullo discrimine habebo*

It was the creed of our predecessors, magnificently stated by Jefferson, when he wrote: "These [scientific] societies are always in peace, however their nations may be at war Like the republic of letters, they form a great fraternity spreading over the whole earth, and their correspondence is never interrupted by any civilized nation" During the troubled days through which we are passing, we may well turn to this faith proclaimed by a man who was at the same time a great American and a world philosopher, in order to find in it strength for the present and hope for the future[9]

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[9] That this spirit has not died appears in the "Resolution on Interrelations among Scientists of the Western Hemisphere," published in the June number of the *A A A S Bulletin* "By Intellectual Intercourse they can exemplify the interdependence of scientific workers, and later, at a happier time, they can help to reestablish universally the cooperative activities which are characteristic of the scientific spirit. " The whole manifesto could be quoted in full as an evidence of the survival of the doctrine upheld by Jefferson

PLATE II

BENJAMIN FRANKLIN
President of the Society, 1769-1790
Painted and presented by
Charles Willson Peale, 1785

THE BEGINNINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY

CARL VAN DOREN

(Read April 24, 1943)

THE American Philosophical Society and Thomas Jefferson, who was to be the Society's third president, were born so nearly at the same time that their birthdays seem more than a coincidence: almost concurrent prophecies. Jefferson in Virginia was exactly six weeks old on the day Benjamin Franklin wrote or printed—or at least dated—*A Proposal for Promoting Useful Knowledge among the British Plantations in America*, the grand outline of what Franklin in it was the first to call the American Philosophical Society. That spring of 1743 saw the beginnings both of co-operative scientific inquiry in North America and of the individual who of all American statesmen, after Franklin, had the fullest comprehension of science and did most to further its interests.

Enthusiasts have argued that the American Philosophical Society had its origin in the famous Junto founded by Franklin in 1727. The argument has little to support it except the desire—if a desire is a support—to make the Society out to be sixteen years older than it is. The Junto was a club for the mutual improvement of its members and for public benefit to Philadelphia. The members were to report at each meeting the remarkable things they had lately met with, "particularly in history, morality, poetry, physic, travels, mechanic arts, or other parts of knowledge." But such exchanges were for the sake of the members' education and were plainly expected to come from this or that published book, not from their own researches or discoveries. History, morality, poetry, and travels outweighed medicine ("physic") and mechanic arts on the list of topics to be reported. Science generally was lumped among "other parts of knowledge." The Junto members were primarily congenial friends and good citizens, only incidentally scientists. That some of them, those most concerned with science, later became members of the American Philosophical Society when it was formed meant hardly more then than it does now when a member of the Franklin Inn is elected to the Society.

If anything resembling the Society existed, even in idea, before Franklin's *Proposal* of May 1743, it was a suggestion that seems to have been made by John Bartram. By 1739 Bartram already had something of a name as a homespun botanist, who had traveled from his farm at Kingsessing, three miles from Philadelphia, northwest to the source of the Schuylkill, into the Jerseys, Delaware, and Maryland, and as far south in Virginia as to the James, paying his expenses by sending boxes of plants, seeds, and fossils (at five guineas a box) to various lords and gentlemen in England who were curious about the botany of the New World or eager to adorn the splendid gardens which were so greatly admired in the Old. While those collectors were ransacking the earth for plants that might grow ornamentally or usefully in England, they gave special attention to the vast colonial wilderness across the Atlantic. America was a fashion, and not merely for its trees, shrubs, and flowers. There was even a London merchant who "had young bears brought over every year, and fatted them with *dumplings* and sugar." His friend Peter Collinson thought that the "north American *Ursus*" had the "most agreeable taste of all flesh . . . and the fat is whiter and sweeter than the fat of lambs."

With these passing fashions in luxury went a genuine scientific curiosity about the American flora. Linnaeus' *Systema Naturae* (1735) and *Genera Plantarum* (1736) had given a quick impetus to the rise of modern systematic botany. Mark Catesby, after two botanizing voyages to America, in 1739 was working in London on his *Natural History of Carolina* (1730–1748). Jan Frederik Gronov (Gronovius) of Leyden had begun to print his *Flora Virginica* (1739–1743), based largely on the studies of John Clayton of Virginia, who had developed a notable botanic garden in Gloucester County. John Mitchell, also of Virginia, was botanist and physician at Urbanna on the Rappahannock. He had met Bartram and was soon to be in correspondence with most other botanists in America as in Europe. James Logan of Pennsylvania had made, at Stenton, his most important scientific experiments, on the impregnation of the seeds of plants. Cadwallader Colden of Orange County, New York, had begun to classify the plants of the neighborhood of his manor, Coldengham, according to the Linnaean system Colden, Mitchell, and Clayton were all, as Peter Collinson wrote to Linnaeus in January 1744, "Complete Professors" —that is, followers—of the new botanic doctrine.

Though Clayton and Mitchell knew each other because they lived close together in Virginia, and Logan and Colden because they were both high officials in neighboring provinces, and though the four had probably more in common than any other four scientists in North America, there was no regular communication among them. If any of them heard what another was doing in botany it was as likely to be from their common correspondents in Europe—in London, Leyden, or Upsala—as by letter direct from Virginia to Pennsylvania or New York, from New York or Pennsylvania to Virginia. Indifference rather than jealousy, habit rather than policy, insulated the colonies, in which colonists who had never been in England spoke of going home to it, and rarely thought of traveling to another province on the same continent with themselves. It was left to Bartram, a more impassioned and less conventional botanist than any of the other four, to be the only one who, sooner or later, knew them all and who helped give them whatever sense of personal fellowship they had.

Untaught, ungrammatical, heedless of his spelling and his clothes, Bartram surprised the others not only by the intensity of his devotion to botany but also by the acuteness and range of his observations—as doubtless also by the charm of his unpretending, friendly letters. They were all gentlemen and scholars and officials. Bartram was a plain Quaker farmer who had made himself a botanist But he, aware from hard experience of the miles to be traversed and the amount of work to be done, was first to suggest that a society might be formed to carry out in cooperation what he saw was beyond the reach of any single botanist

He suggested this to Collinson in a letter which is now unfortunately missing but which Collinson answered on July 10, 1739. "As to the Society thee hints at," he wrote,

> had you a set of learned, well-qualified members to set out with, it might draw your neighbours to correspond with you. Your Library Company I take to be an essay towards such a Society But to draw learned strangers to you, to teach sciences, requires salaries and good encouragement; and this will require public, as well as proprietary assistance,—which can't be at present complied with—considering the Infancy of your colony.[1]

Collinson's answer indicates that Bartram had suggested not only a society of corresponding members in the neighbor colonies but also some kind of academy in which imported scholars would teach sciences in Philadelphia Bartram seems to have been effectively discouraged, and at any rate there is no further mention of this society in any letter that has been found from him or to him.

But three years later Franklin's *Pennsylvania Gazette*, on March 17, 1742, printed "A Copy of the Subscription Paper, for the Encouragement of Mr John Bartram" which had been mentioned in the issue of the week before Apparently taking it for granted that the possible subscribers must be convinced of the utility of the project, the paper—which Franklin may or may not have written—opened with two paragraphs on the benefits of botany

> Botany, or the Science of Herbs and Plants, has always been accounted in every Country, as well by the Illiterate as by the Learned, an useful Study and Labour to Mankind, as it has furnished them with Cures for many Diseases, and their Gardens, Groves and Fields with rare and pleasant Fruits, Flowers, Aromaticks, Shades and Hedges.
>
> And as the Wildernesses, Mountains and Swamps in *America*, abound with Variety of Simples [and?] Trees, whose Virtues and proper Uses are yet unknown to Physicians and curious Persons both here and in *Europe*, it should be esteem'd fortunate, and a general Benefit, if a Man could be found sufficiently skilful and hardy, who would undertake, as far as in his Power, a compleat Discovery of such Herbs, Roots, Shrubs and Trees, as are of the Native Growth of *America*, and not described in Herbals or other Books.

Bartram, the paper went on, was such a man. "an accurate Observator," a Pennsylvanian by birth and residence, "of great industry and Temperance, and of unquestionable veracity." The initiators of the plan, in order "to induce and enable him wholly to spend his time and exert himself in these Employments," had proposed an annual subscription for his support; "with which he being made acquainted, and it agreeing with his benevolent Temper, he has promised some of us, that if it appears by what shall be subscribed, that he can maintain himself and Family, and defray the Expenses he must sometimes unavoidably be at in long Journies for Guides and Assistance, he will without delay dispose of his Affairs at Home, and undertake what is desired of him." He was to travel through New York, New Jersey, Pennsylvania (including Delaware), and Maryland, and regularly report to his patrons whatever of value he might learn.

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[1] William Darlington, *Memorials of John Bartram and Humphry Marshall* 132, 1849.

"*Subscriptions are taken in at the Post Office in Philadelphia,*" the *Gazette* announced. "*Near 20 £ a year is already subscribed.*"

The final amount subscribed is not known, nor the names of the subscribers, nor the length of time the venture was continued, though it was intended to run three years. But on December 11, 1742, Bartram said in a letter to England that he might since the death of one of his English patrons have to give up "distant travels, and our Americans have not zeal enough to encourage any difficulties of this kind, at their expense." On June 11 of the year following he wrote that he believed the Philadelphia subscription "is wholly dropped. Some people lay the blame upon James Logan, and not without cause."[8] The details are obscure. Yet it seems clear that as in 1739 Bartram could not find enough fellow-members to make up a society, so in 1742 his friends could not find enough subscribers to enable him alone to carry out the work of such a society by undertaking to make a "compleat Discovery" of the undescribed "Native Growth of *America*." The Library Company, at the insistence of Collinson and in a unanimous desire to help and honor Bartram, in April 1743 made him an honorary member—the first after James Logan—by giving him a share for life. A share cost forty shillings and the annual dues were ten.

Franklin, printer of the *Gazette*, postmaster, and a director of the Library Company, had had experience with successful organizations in Philadelphia, and with his unsuccessful *General Magazine and Historical Chronicle of All the British Plantations in America* (January–June 1741) he had tried to address the intercolonial public. It seems impossible he did not know of Bartram's tentative plan for a society of scientists. It seems no less impossible—in view of Franklin's punctilious habit of giving credit to others whenever credit was due them—to believe that he took over Bartram's suggestion without acknowledgment and claimed it for his own. No facts have come to light which explain the matter either one way or the other.

But on May 14, 1743, Franklin wrote or printed—or only dated—his renowned *Proposal*, in a double folio sheet, the *Proposal* printed on the first and second pages, the third and fourth blank. This is among the very rarest of all pieces of Frankliniana. The American Philosophical Society has no copy of the original. The copy in the Library of Congress has been put away for safekeeping during the present war. These researches have been able to trace only one other in America, that in the Mason-Franklin Collection at Yale. It is the copy from which Jared Sparks printed the document in his *Works of Benjamin Franklin* (6: 14-17) a hundred and three years ago, with slight editorial changes that have been followed ever since. This must probably always remain the most precious copy of the *Proposal* in existence. For it not only is a surviving original but it also has written on the blank fourth page a letter from Bartram to Cadwallader Colden, the first corresponding member of the Society, which furnishes the earliest information that the Philadelphia members had already had meetings and had chosen members from other colonies.

Bartram, according to Collinson, had merely hinted at a society that might be organized. Franklin's *Proposal*, long familiar to all who know anything about the intellectual history of America, was extensive and explicit. "The first Drudgery of Settling new Colonies, which confines the attention of People to mere Necessaries, is now pretty well over, and there are many in every Province in Circumstances that set them at Ease, and afford Leisure to cultivate the finer Arts, and improve the common Stock of Knowledge." But such men were widely separated and could seldom meet or talk together, "so that many useful Particulars remain uncommunicated, die with the Discoverers, and are lost to Mankind." Therefore Franklin proposed "That one Society be formed of Virtuosi or ingenious Men residing in the several Colonies, to be called *The American Philosophical Society*." The "Centre of the Society" was to be the central city of Philadelphia, where there would be always at least seven members, "a Physician, a Botanist, a Mathematician, a Chemist, a Mechanician, a Geographer, and a general Natural Philosopher, besides a President, Treasurer and Secretary." These ten would meet to exchange their own

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[8] Darlington, *Memorials*, 162, 164.

"Observations, Experiments, &c" and to direct the "constant Correspondence" which would keep all the members of the Society informed of its significant transactions The subjects of their correspondence were to be, roughly, botany, medicine, mining and mineralogy, mathematics, chemistry, mechanics, geography, agriculture, stock-breeding, horticulture, "And all philosophical Experiments that let Light into the Nature of Things, tend to increase the Power of Man over Matter, and multiply the Conveniencies or Pleasures of Life"

In proposing that "by Permission of the Postmaster-General, such Communications pass between the Secretary of the Society and the Members, Postage-free," Franklin may have meant either that he already had the permission or that he expected to obtain it Whether or not he ever had a formal authorization, he could and did, as postmaster in Philadelphia, frank members' letters sent from there and permit letters sent to members in his care from elsewhere to be delivered without postal charges This was more important than is now commonly realized The postage for a letter from Philadelphia to New York in 1743 was ninepence a single sheet; from New York to Boston one shilling, from New York to Williamsburg one shilling threepence, and to Charleston (by water) one shilling That is, a letter from Charleston to Boston would cost two shillings a sheet, or about two dollars in 1943 values, a scientific communication of, say, five sheets, about ten modern dollars. Ninepence for a single sheet between New York and Philadelphia amounted to about seventy-two cents, and longer communications in proportion The promise that letters would go free must have been very tempting to prospective members The proposed annual dues, "a Piece of Eight" (or Spanish dollar worth eight reals which survive in the American vernacular as eight bits), would be less than a member might save in postage every year

It was easy for Franklin to write his *Proposal* and have it printed, and perhaps to enlist the Philadelphia members of the Society It was difficult to engage them in scientific work with anything like Bartram's or Franklin's zest, and still more difficult to find corresponding members and draw them into the circle of communication which the enterprise looked forward to Nothing of the sort had been attempted in America before, and even those virtuosi or ingenious men who welcomed the new venture were too busy to spare time for it, or were hesitant about putting their observations and experiments on paper, or were so far apart that they could not feel much involved in the common effort. The story of the beginnings of the Society is chiefly a story of its difficulties, its failure to advance along the lines first intended, and the unanticipated special success which so diverted it after four years as to cause a prolonged lapse in its general activities

Though the *Proposal* is dated May 14, 1743, neither Bartram nor Franklin was able to work on the scheme that summer. Bartram left about the first of July for a two-months' journey to Lake Ontario in the company of Conrad Weiser, Pennsylvania's Indian interpreter, and Lewis Evans, the geographer. Franklin must have set out for New England almost as soon as his *Proposal* was printed. For eleven days later, on the 25th, he was present at a meeting of the First Lodge (St. John's) of Freemasons at Boston [3] Ironically, in view of Franklin's later preoccupations, this was probably the month—and certainly was the summer—when he first met Dr. Adam Spencer and saw him perform some inexpert electrical experiments,[4] but did not yet become greatly interested For Franklin his meeting that summer with Cadwallader Colden then seemed more important

While it has long been known that the two met accidentally and briefly "on the road,"[5] nobody has ever taken the trouble to do more than speculate as to where and when this took place. A few facts and dates come close to fixing it. Franklin was back in Philadelphia by July 28, when he wrote a letter to his sister Jane Mecom in Boston. Colden went that July to Norwich, as a member of a joint commission to determine the title to the lands of the Mohegan Indians, claimed by the Mohegans themselves, by the white occupants of the lands, and by Connecticut.[6] Since the meeting of Franklin and Colden was brief, they could not have travelled together but must have met between New York and Norwich while going in opposite directions Franklin presumably on his return, Colden on his way eastward At whatever tavern or ferry or stretch of the road this was, the conversation was long enough for Colden to speak of a method of printing he thought might be useful, and for Franklin to mention his scheme for the Society From this meeting sprang the correspondence (indispensable to any historian of the Society) between Colden, who was not only a scientist of considerable reputation but also a member of his Majesty's Council for New York, and the still obscure printer from Philadelphia whose star was so soon to rise so high

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[3] J F. Sachse, *Benjamin Franklin as a Free Mason*: 82, 1906.

[4] Franklin (*Writings*, Smyth ed., 2: 223) gives the correct date of the meeting, which is incorrectly dated on p. 417 of the same volume

[5] Franklin, *Works*, Sparks ed., 6: 24.

[6] Colden, *Letters and Papers* (9 v., 1918–1937; throughout this paper quoted with the permission of the New York Historical Society) 3: 25–26; F. Morgan, *Connecticut as a Colony and as a State* (4 v., 1904) 1: 287

Colden wrote first, from Coldengham sometime in October, sending a copy of a paper he had the year before sent to Collinson on Colden's independent invention of something not unlike early stereotype printing "Ever since," Colden added to Franklin,

> I had the pleasure of a conversation with you, though very short, by our accidental meeting on the road, I have been very desirous to engage you in a correspondence I long very much to hear what you have done in your scheme of erecting a society at Philadelphia for promoting of useful arts and sciences in America If you think of anything in my power, whereby I can promote so useful an undertaking, I will with much pleasure receive your instructions for that end [7]

This letter went to Philadelphia by Colden's son Cadwallader, who on his return carried an answer from Franklin dated November 4

Franklin promised to study Colden's method of printing "very attentively and particularly, and in a post or two to send you some observations on every article"--observations which have not been found "My long absence from home in the summer," he continued, "put my business so much behindhand, that I have been in a continual hurry ever since my return, and had no leisure to forward the scheme of the Society But that hurry being now near over, I purpose to proceed in the affair very soon, your approbation being no small encouragement to me"[8] He made some return for Colden's approbation by reprinting in the *Pennsylvania Gazette* for January 11 and 26 and February 2 a long paper by Colden on the yellow fever epidemics of 1741 and 1742 in New York, which Colden had printed in the *New-York Weekly Post-Boy*, then published by Franklin's silent partner James Parker This paper had caused a stir in New York and had led the authorities to order that the stagnant pools round the town be drained

By March 27 the Society had made some progress On that day Bartram, writing on the back of the *Proposal* he was sending to Colden, said

> *I have here sent thee one of our proposals for* forming A Philosophical Society we have already had three meetings & several Learned & Curious persons from our neibouring Colonies hath allready Joyned membership with us & we hope thee will pleas to do us yᵉ honor to be enroled in our number I hope this undertaking may be of publick benefit to our american Colonies if we act with diligent application in this afair [9]

Although an entry, made years later, in the records of the Society seems to list Colden as elected to corresponding membership in 1743,[10] Bartram's letter implies that Colden in March 1744 had not yet accepted and had not yet seen the *Proposal* But Colden in the following June wrote, to Collinson, that the Philadelphians had "done me the honour to take me into their Society, tho"– he surprisingly added—"I be not in any manner acquainted with any of them except Mr Bartram who has undertaken the Botanical part"[11] Possibly Colden did not think of his brief encounter with Franklin as having given them more than a writing acquaintance, or more possibly, he thought of Franklin as merely the secretary, not as one of the scientists

On April 5 Franklin, then on an errand to New York, wrote to Colden at Coldengham the letter[12] which tells almost all that has hitherto been known about the original organization and members of the Society It was, he said, "actually formed, and has had several Meetings to mutual Satisfaction, as soon as I get home, I shall send you a short Acct of what has been done and propos'd at those Meetings" (If he ever sent the promised account, it has not been found) Thomas Bond had been chosen the physician of the Philadelphia circle, Bartram the botanist, Thomas Godfrey the mathematician, Samuel Rhoads the mechanician, William Parsons the geographer, Dr. Phineas Bond the general natural philosopher; Thomas Hopkinson the president, William Coleman the treasurer; and Franklin, of course, the secretary. They had not, apparently, been able to find the chemist Franklin's *Proposal* had called for

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[7] Franklin, *Works*, Sparks ed , 6. 24–25

[8] Franklin, *Writings*, Smyth ed , 2. 241.

[9] Quoted with permission from the original in the Mason-Franklin Collection, Yale University Library

[10] *Proceedings* 22, pt. 3 4

[11] Colden, *Letters and Papers* 3 60

[12] Franklin, *Writings*, Smyth ed , 2 276–277

"To whom," Franklin went on, "the following Members have since been added, viz Mr Alexander, of New York. Mr Morris, (Ch Justice of the Jerseys) Mr Home, Secretary of do Mr Jn Coxe, of Trenton and Mr Martyn, of the same place" These have been identified as James Alexander (the famous lawyer who was member of the Councils of both New York and New Jersey and father of the future Revolutionary general who claimed the Scottish title of Earl of Stirling), Robert Hunter Morris (afterwards governor of Pennsylvania), Archibald Home (who died the following summer and was commemorated with a poem "By a Lady" in the *Pennsylvania Gazette* for August 16), John Coxe (whose grandfather had been a physician to Charles II and later to Queen Anne and a member of the Royal Society, and who was himself a Jersey lawyer and landowner), and (presumably) David Martin of Trenton, sheriff of Hunterdon County, who afterwards removed to Philadelphia and in 1750 became rector of the Academy, only to die the next year. None of them except Alexander and Martin is known to have had any special inclination to scientific pursuits, and all of them were of a land-owning, office-holding class unlike that of the tradesmen members in Philadelphia The Society might think philosophers best for corresponding members and yet think influential officials better than no corresponding members at all

Richard Nicholls, postmaster in New York, had told Franklin, who wrote it to Colden, "of several other Gentlemen of this City, that incline to encourage the Thing And there are a Number of others, in Virginia, Maryland, Carolina, and the New England Colonies, who we expect to join us, as soon as they are acquainted that the Society has begun to form itself"

Historians of the Society have wondered what men Franklin here had in mind. James Alexander in a letter to Colden on November 12 of that same year named four New Yorkers besides Alexander himself who had joined. "At our last Court Mr Chief justice Mr Horsmanden Mr Murray Mr Smith & Several others sent their names as members of the Society."[13] The four were Chief Justice James De Lancey (afterwards lieutenant governor), Daniel Horsmanden (member of the Council, judge of admiralty, and afterwards chief justice), Joseph Murray (an able lawyer and legal historian), and William Smith (who afterwards declined the office of chief justice, and whose son was the last royal chief justice of New York) The names of the several others have not been found, but they were presumably judges or lawyers like the four named

The gentlemen from New England and the South about whom Franklin wrote hopefully to Colden were slow in giving their names to the unprecedented venture. But in September John Mitchell came from Virginia to Philadelphia for a visit with his new associates "I cant," Bartram wrote to Colden on November 2,

> well pass by Giving thee some account of my friend Mitchel who is a Member of our Society he did me the honour of Calling at my house & staid all night & I next morning to demonstrate the kindness & esteem I had for his Company went with him to town & he being an intire stranger I introduced him into the company of our friend Benjamin to whose Care I left him for the present. he staid in town near three weeks so that I had the favour of his Company many times at my house in the fields & in the woods which I was well pleased with he is an excelent Phisition & Botanist & hath dipped in the Mathematicks which inclined A Gentleman in Town well known to us to say to me that our doctors was but novices to him. but another person more volatil & more extravagantly expressed his value for him tould me thay had not the Milioneth part of his knowledge—But notwithstanding the satisfaction I received in the Doctors Company I could not help mentioning my friend Colden to him & set thy abilities & Character in such A clear light before him which together with some specimens of thy performance so inflamed the doctors mind (that tho his Constitution is miserably racked) he said that if he was sure he could See thee at York he would venture so far for the sake of a little of thy Company[14]

Mitchell expected to find the Society more fully formed and more active than it turned out to be. He spent the whole of the 13th with Franklin, who planned to take him to call on James Logan the next day.[15] Colden had sent Franklin, for Logan's opinion, a "Piece on Fluxions," and Franklin probably still had

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[13] Colden, *Letters and Papers* 3. 82–83.

[14] Colden, *Letters and Papers* 3: 79.

[15] Unpublished letter from Franklin to Colden, September 13, 1744, in the Mason-Franklin Collection, Yale University Library.

Colden's account of his method of printing. But the papers from Colden, Mitchell learned, were the only contributions that had yet come in from members of the Society,[16] either in Philadelphia or elsewhere Mitchell had with him a manuscript "history or treaties of the pines in virginia" which he gave Bartram to read,[17] and a "little piece" on yellow fever which he had written out of his experience in the Virginia epidemics of 1737, 1741, and 1742. This little piece, as he wrote to Colden on September 10, 1745, he thought might be "fit . for the records of the Philosophic Society."[18] There were, he was sorry to learn, nothing like enough records to warrant the Society in beginning the series of annual Collections that Franklin had proposed Mitchell permitted Franklin to send the notes on yellow fever to Colden, with a letter of October 25. "He desires," Franklin wrote, "your Sentiments of it and to be favour'd with any other Observations you have made on the same Distemper . . When you have perus'd it, please to return it "[19]

Since there were no Collections in which Mitchell's papers might be printed, he later recalled the botanical essay he had left with Bartram and declined to give Franklin permission to print the medical essay separately, though he might give it to any physician to read[20] In those slow-moving times it was June 15 of the next year before Franklin wrote to ask if he might issue the treatise on yellow fever under his own imprint, and September 12 before Mitchell, declining, gave his reasons

"I was highly delighted," Mitchell wrote,

> to see so good an opportunity any one might have to oblige the publick, & promote the arts of Sciences, as your Press affords, better than I expected to have found in our new world . But you must excuse my not publishing any thing yet a while I think this world is pestered with the Itch of many to appear in print, which makes many so little regarded that do. Authors ought to be Masters not only of the particular subject, but of the whole art, they undertake to instruct the world in, & when they are --*Nonum prematur in annum*, sales Horace[21]

Unable to revisit Philadelphia again that fall as Franklin urged, Mitchell in 1746 left Virginia for England and spent the rest of his life there. Though his promising connection with the American Philosophical Society was broken off, he continued to write on American subjects, and in 1755 published his great map which was to be so often used in boundary negotiations and which is commonly held to be the most important map in American history

Making its way slowly in America, the Society was hailed in Europe with an eagerness that disturbed its founders Colden wrote to Collinson about it in June 1744

> No doubt you will hear of a Philosophical Society now forming at Philadelphia They have given an invitation to several in the neighboring Colonies to join with them I have not as yet seen any thing from the Philadelphia Society & its probable that the members of the other Colonies will wait for an example from those at Philadelphia before they'l offer any thing so that I cannot tell what expectations to give you of that undertaking We have in America for some time past made great progress in Aping the Luxury of our Mother Country I am glad that some now Indeavour to imitate some of its Excellencies

And Collinson on August 23 replied with moral as well as scientific approval

> I can't enough commend the Authors & promoters of a Society for Improvemt of Natural knowledge Because It will be a means of Uniteing Ingenious Men of all Societies together and a Natural Harmony be got which will be Dayly produceing Acts of Love & Friendship and will ware away by Degrees any Harsh opinions, parties may have Conceived of Each other, the Fruits of Wisdome & knowledge are Excellent, besides the Mind being Enlarged the Understanding Improved, the Wonders in the Creation Explored, and Ingenious & Good people will know one another & Rejoice in the Friendship of those Like minded as themselves, and as there will be a Laudable Emulation to Excell in the Several Branches of Science the Same good Disposition will Influence them to Beneyolence & Good will to Each other In Every Capacity.
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> I shall wait with Some Impatience for their Memoirs I expect Something New from your New World, our Old World as it were Exhausted[23]

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[16] Colden, *Letters and Papers* 3: 321

[17] Colden, *Letters and Papers* 3. 180

[18] Colden, *Letters and Papers* 3 321.

[19] Colden, *Letters and Papers* 3 77–78.

[20] This manuscript, returned by Coldon to Franklin, remained in Franklin's hands, passed in time to Benjamin Rush and then to David Hosack, and by Hosack was eventually printed in the *American Medical and Philosophical Register* 4, 181–225, 1814. Colden's comments on it, in a letter dated June 8, 1745, appeared in the same volume of the *Register*, pp. 378–383.

[21] Colden, *Letters and Papers* 3 151–153

[23] Colden, *Letters and Papers* 3. 60 61, 69

The European scholars could hardly guess how sketchy and skimpy the organization of the new Society was, or how busy and dispersed its members were. In Europe any society of the kind would soon begin to publish its findings. So, it was there assumed, would the American Society. How the news of this European enthusiasm affected the Philadelphians appears in a letter Bartram wrote to Colden on October 4, 1745.

> I find by my corespondents in Europe that they have been informed of our Phylosophycal Society & have great expectation of fine accounts therefrom tho I durst not so much as mention it to my correspondents for fear it should turn out but poorly, but I find the[e] mentioned to Collinson hee to Catesby, & hee to Gronovius, which was to him from Cla[y]ton these accounts I showed to franklin & he layeth the blame on us, & Dr Bond Saith Ben Franklin is in fault, however we three talks of carrying it on with more dilligence than ever which we may very easily do if we could but exchange the time that is spent in the Club, Chess & Coffee House for the Curious amusements of natural observations.[23]

Franklin on August 15 of the same year had written to Colden that the Philadelphia members of the Society were "very idle gentlemen. They will take no pains."[24] If he did not, like Bartram, deplore the time wasted in conviviality, this was perhaps because Franklin was as convivial as any of the members. On June 25 he had turned aside from the sober sciences to write his Advice to a Young Man on the merry science of choosing a mistress. On August 17, two days after he told Colden about the idle gentlemen in Philadelphia, he wrote his facetious letter to James Read with its jokes in Latin offered as variant readings of a passage from Thomas à Kempis.[25] This was, perhaps, the most light-hearted year in Franklin's life since he came back from London at twenty to settle in Philadelphia. His new foreman from Edinburgh by way of London, David Hall, had assumed many of the responsibilities of the printing house. Franklin saw retirement from business not far ahead of him, and he had not yet become absorbed in any single study as he was shortly to be in electricity. His own passion for science was diffused where it was not latent. In relation to the American Philosophical Society he was less a scientist in his own right than an impresario of scientists.

Years later, when the Society was being revived in 1768, William Franklin spoke of the "papers &c which belong to it. I think I saw them all some years ago in my Father's possession and have no doubt but they are so still."[26] These papers have never been found, if they ever existed. Benjamin Franklin may possibly have kept minutes of the meetings, the letters and communications he received, the records and accounts which would ordinarily have been preserved. Just possibly these or some of them may some day come to light. But as matters stand, there is nothing to indicate when or where meetings were held in Philadelphia or what was done at them or what share the other members besides Franklin and Bartram took in the Society's activities. Though Francis Alison, according to a later record,[27] is said to have been an early member of the Philadelphia group, he is not mentioned by Franklin as a member. There is not a word of Franklin's about the New Jersey members, Morris, Home, Coxe, and Martyn, after Franklin's letter of April 5, 1744, and not any word at all about the membership of De Lancey, Horsmanden, Murray, and Smith of New York, or of Mitchell of Virginia. Thus was not so much a Society as a scheme leading to a Society. It was a Society on paper—but so far as any discovered records show, there were no papers.

After 1744, when the Society showed most signs of life, the records represent no members as much concerned with the Society except Franklin and Bartram in Philadelphia, Colden in New York. Mitchell seemed to think of his trip to Philadelphia as a visit to Bartram and Franklin rather than to the Society he had joined. James Alexander, writing to Colden on November 12, 1744, said: "I am much of your mind that Mr. Franklins proposeal of a Society will prove very usefull. . . I shall be very glad to See him here at New York, & shall give him all the Encouragement in my power to proceed in the affairs of the Society & other useful undertakings."[28] It was probably Alexander who influenced the New York lawyers to send their names as members. But he himself apparently

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[23] Colden, *Letters and Papers* 3: 159–160.

[24] Franklin, *Writings*, Smyth ed., 2: 289.

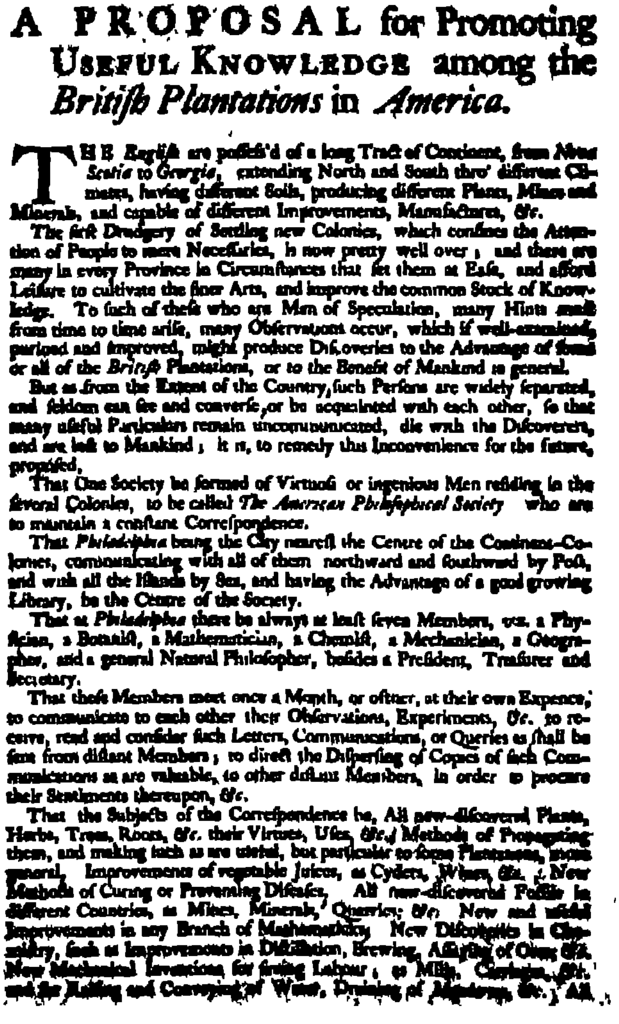
[25] *Port Folio* (Philadelphia), May 23, 1801, printed in part in Carl Van Doren, *Benjamin Franklin*, 792, 1938.

[26] *An Historical Account of the Origin and Formation of the American Philosophical Society*, 139, 1914.

[27] *Proceedings* 22, pt. 3, 1–4.

[28] Colden, *Letters and Papers* 3, 82–83.

PLATE III



A PROPOSAL for Promoting USEFUL KNOWLEDGE among the *Britiſh Plantations* in *America*.

THE *Engliſh* are poſſeſs'd of a long Tract of Continent, from *Nova Scotia* to *Georgia*, extending North and South thro' different Climates, having different Soils, producing different Plants, Mines and Minerals, and capable of different Improvements, Manufactures, *&c.*

The firſt Drudgery of Settling new Colonies, which confines the Attention of People to mere Neceſſaries, is now pretty well over; and there are many in every Province in Circumſtances that ſet them at Eaſe, and afford Leiſure to cultivate the finer Arts, and improve the common Stock of Knowledge. To ſuch of theſe who are Men of Speculation, many Hints muſt from time to time ariſe, many Obſervations occur, which if well-examined, purſued and improved, might produce Diſcoveries to the Advantage of ſome or all of the *Britiſh* Plantations, or to the Benefit of Mankind in general.

But as from the Extent of the Country, ſuch Perſons are widely ſeparated, and ſeldom can ſee and converſe, or be acquainted with each other, ſo that many uſeful Particulars remain uncommunicated, die with the Diſcoverers, and are loſt to Mankind; it is, to remedy this Inconvenience for the future, propoſed,

That One Society be formed of Virtuoſi or ingenious Men reſiding in the ſeveral Colonies, to be called *The American Philoſophical Society* who are to maintain a conſtant Correſpondence.

That *Philadelphia* being the City neareſt the Centre of the Continent-Colonies, communicating with all of them northward and ſouthward by Poſt, and with all the Iſlands by Sea, and having the Advantage of a good growing Library, be the Centre of the Society.

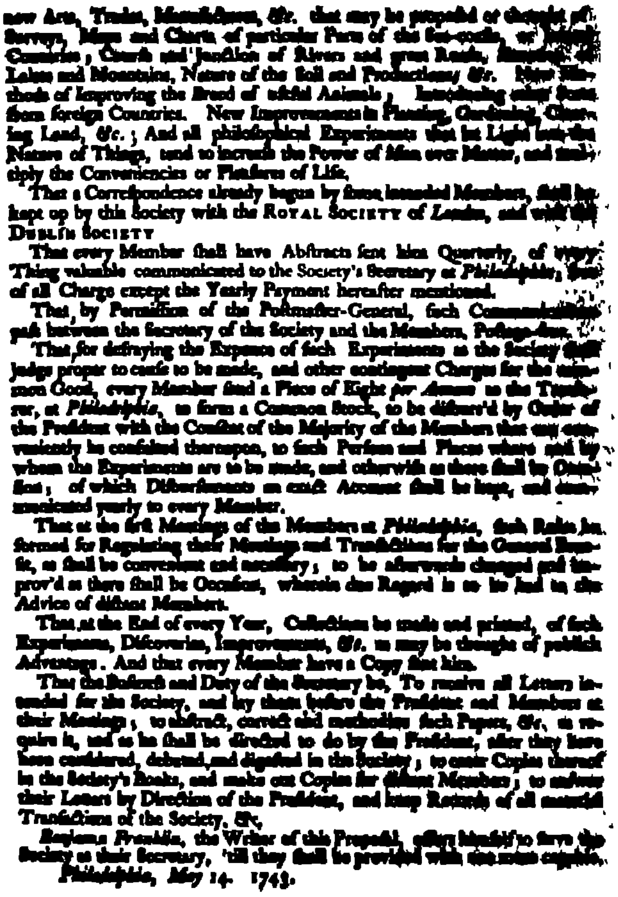
That at *Philadelphia* there be always at leaſt ſeven Members, viz. a Phyſician, a Botaniſt, a Mathematician, a Chemiſt, a Mechanician, a Geographer, and a general Natural Philoſopher, beſides a Preſident, Treaſurer and Secretary.

That theſe Members meet once a Month, or oftner, at their own Expence, to communicate to each other their Obſervations, Experiments, *&c.* to receive, read and conſider ſuch Letters, Communications, or Queries as ſhall be ſent from diſtant Members; to direct the Diſperſing of Copies of ſuch Communications as are valuable, to other diſtant Members, in order to procure their Sentiments thereupon, *&c.*

That the Subjects of the Correſpondence be, All new-diſcovered Plants, Herbs, Trees, Roots, *&c.* their Virtues, Uſes, *&c.* Methods of Propagating them, and making ſuch as are uſeful, but particular to ſome Plantations, more general. Improvements of vegetable Juices, as Cyders, Wines, *&c.* New Methods of Curing or Preventing Diſeaſes. All new-diſcovered Foſſils in different Countries, as Mines, Minerals, Quarries; *&c.* New and uſeful Improvements in any Branch of Mathematicks; New Diſcoveries in Chemiſtry, ſuch as Improvements in Diſtillation, Brewing, Aſſaying of Ores, *&c.* New Mechanical Inventions for ſaving Labour; as Mills, Carriages, *&c.* and for Raiſing and Conveying of Water, Draining of Meadows, *&c.* All

(*Courtesy of Yale University Library*)

PLATE IV



new Arts, Trades, Manufactures, &c. that may be propoſ'd or thought of. Surveys, Maps and Charts of particular Parts of the Sea-coaſts, or Inland Countries; Courſe and Junction of Rivers and great Roads, Situation of Lakes and Mountains, Nature of the Soil and Productions; &c. New Methods of Improving the Breed of uſeful Animals; Introducing other Sorts from foreign Countries. New Improvements in Planting, Gardening, Clearing Land, &c.; And all philoſophical Experiments that let Light into the Nature of Things, tend to increaſe the Power of Man over Matter, and multiply the Conveniencies or Pleaſures of Life.

That a Correſpondence already begun by ſome intended Members, ſhall be kept up by this Society with the ROYAL SOCIETY of *London*, and with the DUBLIN SOCIETY.

That every Member ſhall have Abſtracts ſent him Quarterly, of every Thing valuable communicated to the Society's Secretary at *Philadelphia*; free of all Charge except the Yearly Payment hereafter mentioned.

That, by Permiſſion of the Poſtmaſter-General, ſuch Communications paſs between the Secretary of the Society and the Members, Poſtage-free.

That, for defraying the Expence of ſuch Experiments as the Society ſhall judge proper to cauſe to be made, and other contingent Charges for the common Good, every Member ſend a Piece of Eight *per Annum* to the Treaſurer, at *Philadelphia*, to form a Common Stock, to be diſburs'd by Order of the Preſident with the Conſent of the Majority of the Members that can conveniently be conſulted thereupon, to ſuch Perſons and Places where and by whom the Experiments are to be made, and otherwiſe as there ſhall be Occaſion; of which Diſburſements an exact Account ſhall be kept, and communicated yearly to every Member.

That at the firſt Meetings of the Members at *Philadelphia*, ſuch Rules be formed for Regulating their Meetings and Tranſactions for the General Benefit, as ſhall be convenient and neceſſary; to be afterwards changed and improv'd as there ſhall be Occaſion, wherein due Regard is to be had to the Advice of diſtant Members.

That at the End of every Year, Collections be made and printed, of ſuch Experiments, Diſcoveries, Improvements, &c. as may be thought of publick Advantage. And that every Member have a Copy ſent him.

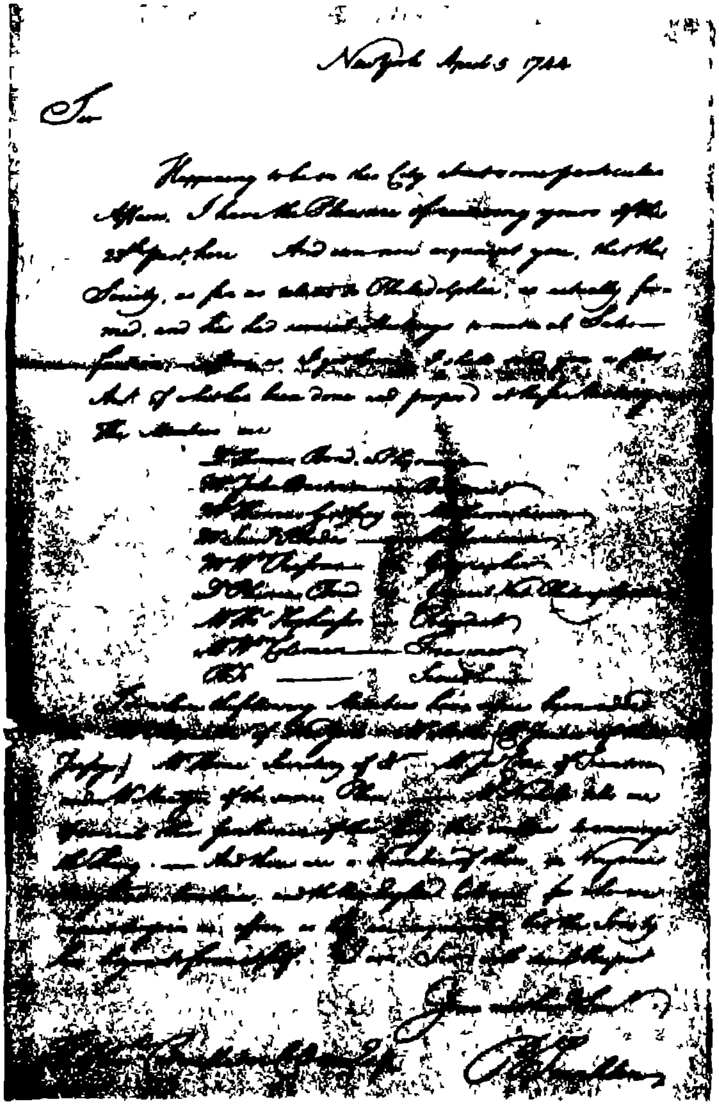
That the Buſineſs and Duty of the Secretary be, To receive all Letters intended for the Society, and lay them before the Preſident and Members at their Meetings; to abſtract, correct and methodize ſuch Papers, &c. as require it, and as he ſhall be directed to do by the Preſident, after they have been conſidered, debated, and digeſted in the Society; to enter Copies thereof in the Society's Books, and make out Copies for diſtant Members; to anſwer their Letters by Direction of the Preſident, and keep Records of all material Tranſactions of the Society, &c.

Benjamin Franklin, the Writer of this Propoſal, offers himſelf to ſerve the Society as their Secretary, 'till they ſhall be provided with one more capable.

Philadelphia, May 14. 1743.

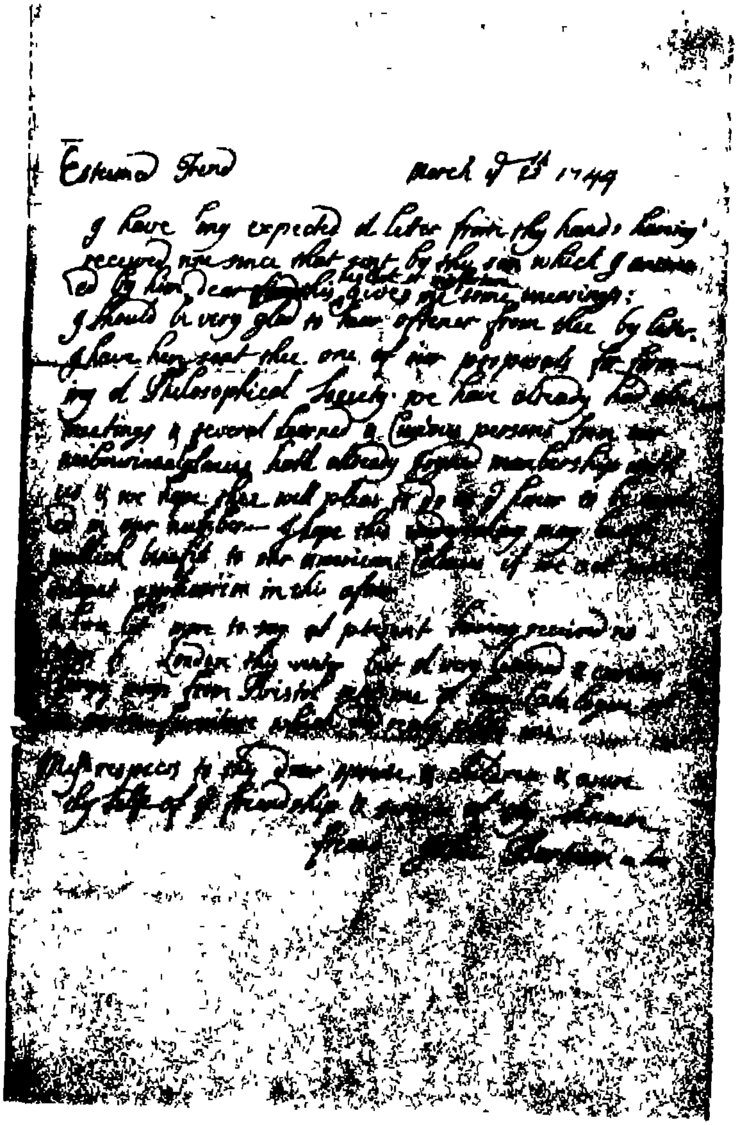
(*Courtesy of Yale University Library*)

PLATE V



Letter from BENJAMIN FRANKLIN to CADWALLADER COLDEN
April 5, 1744
(Original in Library of American Philosophical Society)

PLATE VI



Esteemed Friend   March ye 27 1744

I have long expected a letter from thy hands having
received none since that sent by thy son which I answer-
ed by him dear [illegible] gives [illegible] some meanings;
I should be very glad to hear oftener from thee by letter.
I have here sent thee one of our proposals for form-
ing a Philosophical Society we have already had [illegible]
meetings & several learned & [illegible] persons from our
neighbouring places hath already signed membership [illegible]
[illegible] if we [illegible] these will please [illegible] I [illegible] to [illegible]
[illegible] our number— I hope this [illegible] may be of
publick benefit to the American Colonies if [illegible]
[illegible] [illegible] in this affair
I have [illegible] more to say at present having received no
[illegible] from London this winter but a very [illegible] & [illegible]
[illegible] from Bristol [illegible]
[illegible] which [illegible]
My respects to thy dear spouse & children & accept
thy self of ye friendship & [illegible] of thy [illegible]
friend [illegible] Bartram

Letter from JOHN BARTRAM to CADWALLADER COLDEN
March 27, 1744
(Courtesy of Yale University Library)

made no early observations or experiments and sent no communications to Franklin

Generally speaking, the members appear not to have carried out original investigations or to have written about them. Thomas Godfrey, the Society's mathematician, sent to the *Pennsylvania Gazette* for March 5, 1745, a mathematical problem regarding the time it would take a privateer to overtake a ship, sailing on a given course at a given speed Thomas and Phineas Bond announced, in the *Gazette* for January 6, 1747, that they would make a series of experiments to determine the curative properties said to have been noted in the "new discovered Wells in *Virginia*" Otherwise the Philadelphia members who Franklin said were idle seem to have been also silent Even Bartram, whom Colden urged to "communicate your knowledge of our American plants to the Public," held back His first book, the *Observations* made on his journey to Lake Ontario in 1743, was not published till 1751, and then in London

The earliest publication that can be actually, if not technically, associated with the Society is Franklin's *An Account of the New Invented Pennsylvanian Fire-Places*, which the *Gazette* for November 15, 1744, said had just been published. This has been called a piece of sales promotion, written for the benefit of Robert Grace, of the Junto, who was in straits for money and whom Franklin, himself refusing to patent the invention, had permitted to manufacture and sell these Franklin stoves But Franklin had invented the stove in the winter of 1740–41,[29] and it had been on sale at the Philadelphia post office on December 3, 1741, when the *Gazette* first advertised it. What in 1741–43 might have been a simple pamphlet about a new invention came in 1744 to be a small treatise on the principles of physics involved in heating a room, on the value of indoor warmth to health and beauty, on other types of stove with their disadvantages, and a detailed account of the construction of the Franklin stove with directions to any bricklayer who might install it In text and footnotes Franklin cited Martin Clare on *The Motion of Fluids*, Antonio Porto's *De Militis Sanitate tuenda* (quoted in Latin), Hermann Boerhaave, the Chinese Tchang Seng's *Art of procuring Health and Long Life* as translated in Père Du Halde's *China*,[30] Nicolas Gauger's *La Méchanique de Feu*, Lord Molesworth's *Account of Denmark*, J T. Desaguliers ("to whose instructive writings the Contriver of this Machine acknowledges himself much indebted"), and Peter Shaw's *Philosophical Works of Robert Boyle abridged and methodised* While aiding Grace with a sales pamphlet, Franklin was at the same time serving the public with a scientific monograph, as he wished other members of the American Philosophical Society would do Robert Grace, paying Franklin £19–11–0 on December 17 for "sundries printing &c, and paying the Boston engraver for work for the new-invented Fire-place,"[31] and paying more than a mere sales pamphlet need have cost, was in effect making the first known contribution by a non-member to the work of the Society

In New York on November 12 James Alexander, writing to Colden about the new members found there for the Philadelphia Society, went on to speak of Franklin's pamphlet as if it were connected with the same enterprise "His piece about his new invented Stove chimneys is very much approved of here & shows him to be a man of Sense & of a good Stile"[32] Colden that same month sent a copy of the piece to Gronovius as a "curious & new Invention" which might be "particularly useful to you & Dr Linneus, by preserving your health while it keeps you warm at your studies"[33] It was translated into Dutch and published at Leyden, and two copies had reached Bartram, supposedly from Gronovius, by October 16, 1746[34] Franklin's age thought of the invention of the stove as one of Franklin's scientific achievements He himself included it among the papers "on Philosophical Subjects" which in 1769 he added to his collected *Observations and Experiments on Electricity*

His original proposal "That at the End of every Year, Collections be made and printed, of such Experiments, Discoveries, Improvements, &c as may be thought of publick Advantage And that every Member have a Copy sent him" had brought in almost nothing by September 1744, and Franklin could hardly ask the Society to lend its name to his account of his invention Colden, who went to Philadelphia in the fall of

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[29] Franklin, *Writings*, Smyth ed, 2. 247, 270

[30] Du Halde's *Description geographique, historique, etc de l'Empire de Chine et de la Tartare chinoise* (4 v, 1735), most likely from the English translation of 1738–1741

[31] Franklin's Ledger for 1739–1747, entry quoted in G S Eddy's *Account Books kept by Benjamin Franklin* 61, 1929

[32] Colden, *Letters and Papers* 3 82

[33] Colden, *Letters and Papers* 3 91

[34] Colden, *Letters and Papers* 3· 275

1744, realized that the Society was making slow progress, and the plan for Collections none In December he wrote back to urge Franklin, "if it meet with obstruction from the want of proper incouragement or otherwise," to

> attempt some other Method of proceeding in your Design for I shall be very sorry to have it entirely dropt May you not as Printer propose to Print at certain times a collection of such pieces on the subject of your former proposals which any shall think proper to send you & by way of Speciemen to print such papers as your friends may have communicated to you on your former proposal. For this purpose you may desire a Subscription by all persons indifferently for your Incouragement I do not propose that every thing be printed that shall be sent You may communicate them to the best judges with you of the several subjects on which these papers shall happen to be wrote where you are not willing entirely to trust to your own Judgement & if they be found not fit for the press you may return them with remarks or make some excuse for not publishing them This I expect will in time produce a Society as proposed by giving men of Learning or Genius some knowledge of one another & will avoid some difficulties that allwise attend the forming of Societies in their Beginning Three hundred copies may be sufficient at first till it be discover'd what Incouragement the undertaking meets with & such a number I cannot doubt will sell I shall only add that as men naturally have as great a fondness for the Productions of their Mind as for those of their bodies however ill favour'd they be & bear with as much uneasiness to be deprived of the honour of such Productions as to have another assume to be the father of their Children you must be careful to acknowledge the receipt of every paper so as that the author may think himself secure from pyratical attempts of others[35]

Franklin let months go by before he acknowledged this suggestion in a letter on August 15, 1745. Then he said

> I must, I believe, either the Scheme and proceed with the Papers I have and may receive, in the Manner you advise in one of your former Letters. The mention of your former Letters puts me in mind how much I am in Arrear with you Like some honest Insolvent Debtors, I must resolve to pay ready Money for what I have hereafter, and discharge the old Debt little by little as I am able.[36]

By November 28 Franklin had given up, at least for the present, the projected annual Collections and was

> now determined to publish an American Philosophical Miscellany, Monthly or Quarterly I shall begin with next January, and proceed as I find Encouragement and Assistance As I purpose to take the Compiling wholly upon myself, the Reputation of no Gentleman or Society will be affected by what I insert of anothers, and that perhaps will make them more free to communicate. Their Names shall be publish'd or conceal'd, as they think proper, and Care taken to do exact Justice in Matters of Invention, &c. I shall be glad of your Advice in any Particulars that occur'd to you in thinking of this Scheme, for as you first propos'd it to me, I doubt not but you have well consider'd it[37]

January 1746 found Franklin too busy with his duties as clerk of the Pennsylvania House of Representatives to publish scientific papers. "A long Sitting of our Assembly," he wrote to Colden in a letter of uncertain date but probably late that winter or in early spring, "has hitherto hinder'd me from beginning the Miscellany."[38] Here the matter has been supposed, by all Franklin's editors and biographers, to end. But on October 16 he had not yet given up his plan. He expected soon to go to New England. "It will not be long after my Return from Boston," he wrote Colden,

> before you will see the first Number of the Miscellany I have new Materials by me for 5 or 6 The want of a good Engraver is a great Difficulty with me The Mention of Engraving puts me in Mind, that Mr Evans told me you would permit me to take off some Copies from a Plate you have of the N American Coast. I shall be obliged to you for that favour
>
> When Capt. Honeyman was here, I gave him at his Request, a Paper containing some Acct of Experiments relating to wooden Cannon Enclos'd is a Copy of it, which please to return with your Sentiments, when you have read it. I sent a Copy (without a Name) to Gov. Shirley[39]

This is the most mystifying of all the obscure points in the early history of the American Philosophical Society. How and where had Franklin between September 1744 and October 1746 got hold of enough new materials to make up five or six numbers of his projected Miscellany, what were they about; what became of them? They seem not to survive among his papers, or to have been printed later in other forms Philadelphia, which began to be fairly active in scientific writing after about 1750, is not known to have produced more than a little before 1746 Franklin had only begun the wide acquaintance and correspondence that followed his electrical discoveries. Few of his correspondents before 1746 took care to preserve his letters, nor did he preserve more than a few letters from them, so far as is known It is tantalizing to think that somewhere there may still exist, and still be found, the papers that William Franklin thought in 1768 were in his father's possession. After all, the valuable Bowdoin MSS of Franklin's electrical writings were not found till three years ago [40]

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[35] Colden, *Letters and Papers* 3 93–94

[36] Original in Colden, *Letters and Papers* 3 143, Franklin, *Writings*, Smyth ed., 2: 289.

[37] Original in Colden, *Letters and Papers* 3: 182, Franklin, *Writings*, Smyth ed., 2: 293.

[38] Original in Colden, *Letters and Papers* 3: 184, Franklin, *Works*, Sparks ed., 6: 74.

[39] Colden, *Letters and Papers* 3 275–276.

If these papers of the Society are ever found, they may reveal what need Franklin had for engraving in connection with his Miscellany, and who had experimented with wooden cannon. They may reveal, too, how co-operative and cohesive the Society actually was As the Philadelphia members had no occasion to write letters to each other, the Society's work has to be guessed at chiefly from references in letters between Franklin and Bartram in Philadelphia and corresponding members like Colden and Mitchell in other colonies Such references are bafflingly few They indicate that nearly the whole load was carried by Franklin, with zealous but rather artless help from Bartram, and almost none from anybody else.

Before Franklin had settled on his plans for a Miscellany, he was eager to publish such scientific works as he could in the ordinary way On May 9, 1745, the *Pennsylvania Gazette* announced that Dr Thomas Cadwalader's *An Essay on the West-Indian Dry-Gripes* (lead poisoning) had just been published. Cadwalader is not known to have been at that time a member of the Society. Franklin's Ledger for the year does not show any charge against Cadwalader for printing the book, which Franklin may have printed on his own account On November 28 of that year he wrote to Cadwallader Colden

> I shall be very willing and ready, when you think proper to print your Piece on Gravitation, &c. to print it at my own Expence and Risque If I can be a means of Communicating any thing valuable to the world, I do not always think of Gaining, nor even of Saving by my Business. But a Piece of that kind, as it must excite the Curiosity of all the Learned, can hardly fail of bearing its own Expence [41]

Colden's "piece on gravitation" was a part of the manuscript of what he thought his masterpiece, *An Explication of the First Causes of Action in Matter, And, of the Cause of Gravitation* He had sent the fragment to Franklin on September 17, 1744, with the stipulation that it was to be read only by Franklin and James Logan,[42] and in December of that year had insisted that besides those two and James Alexander he knew nobody "in this part of the world to whos judgement I can refer any thing of this kind"[43] Franklin put off giving a considered opinion Not till after Colden had published his *Explication* through Parker in New York (dated 1745 but actually completed and privately sent to a few of the learned of America and Europe about May or June 1746[44]) did Franklin show the printed treatise to Hopkinson, president of the Society, Coleman, the treasurer, and certain non-members "And all I can learn of their Sentiments concerning it is," Franklin wrote on October 16, 1746, "that they say they cannot understand it, it is above their Comprehension Mr Logan, from whom I expected the most, when I desired his Opinion, said just the same

Our People do not seem to Suppose that you write unintelligibly, but charge all to the Abstruseness of the Subject, and their own want of Capacity "[45]

There were, evidently, no metaphysicians in the Society, or in Philadelphia, who could follow Colden's attempted proof that matter is not inert, as contemporary physics and theology assumed, but that the power of resistance in matter implies a power of action inherent in it Writings sent in by corresponding members, however, did at least sometimes circulate among some of the Philadelphia members - also among non-members. Colden on another occasion sent Franklin a "medical piece," desiring Franklin to show it to "other gentlemen "[46] Yet the Society was, also evidently, not so organized a group as to hold anything like formal deliberations on manuscripts submitted or treatises published by their distant colleagues It was left to Franklin and Bartram to hold the Society together as much as they could and to interest such individual members as they might in subjects which the Society had been formed to study and propagate

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[40] I. Bernard Cohen, *Benjamin Franklin's Experiments*: 152, 1941.

[41] Original in Colden, *Letters and Papers* 3 180, Franklin, *Writings*, Smyth ed., 2. 290-291

[42] Unpublished letter from Colden to Franklin in the Mason-Franklin Collection, Yale University Library

[43] Colden, *Letters and Papers* 3 93

[44] Colden, *Letters and Papers* 3 208, 211

[45] Colden, *Letters and Papers* 3 274

[46] Franklin to Colden, August 15, 1745, *Writings*, Smyth ed., 2 284.

When the Pennsylvania Assembly, of which Franklin was clerk, adjourned on October 18, 1746, and he soon afterwards set out for Boston, he thought he would be ready on his return to begin the Miscellany But when he got back he found himself almost at once absorbed in scientific pursuits that were to change the whole course of his life, as well as of the Society

It has not hitherto seemed possible to make any close conjecture as to just when the electrical tube sent by Collinson reached the Library Company or when Franklin began his electrical experiments Collinson does not mention the gift in any surviving letter, and the Library Company's records do not show when it arrived Franklin in his *Autobiography* (in the part of it written after August 1788) says the tube came soon after his return from Boston[47] Because he there confused the Boston trip of 1743, when he met Dr Spencer, with the other trip of late 1746, his memory has been distrusted about the whole episode But he might easily have made a slip about the year, and yet have accurately remembered that soon after his return he took up his new studies The Assembly met again on January 5, 1747, when Franklin's presence would have been required, and he was certainly in Philadelphia "some days" before the 4th.[48] On March 28 he wrote the first of his famous letters to Collinson, acknowledging the receipt of the tube

This had, Franklin said,

> put several of us on making electrical experiments For my own part, I never was before engaged in any study that so totally engrossed my attention and time as this has lately done, for what with making experiments when I can be alone, and repeating them to my Friends and Acquaintance, who, from the novelty of the thing, come continually in crouds to see them, I have, during some months past, had little leisure for any thing else[49]

None of Franklin's letters before the 1746 trip to Boston mentions electrical experiments He here writes as if his absorption had been continuous since he began his exciting investigations His "some months past" need not mean a longer period than from late December to late March.

Up to this time the principal concerns of the active members of the Society seem to have been botany and medicine Electricity at once outran those sciences Bartram was mystified, he wrote to Colden on March 6, by an element

> thay can so efectualy apply to A man as well as to many other objects as to fill him so full of fire that if another man doth but put his finger to the electrified person the fire will fly & strike that part which approacheth nearest I take this to be the most Surpriseing Phoenomena that we have met with & is wholy incomprehensible to thy friend John Bartram[50]

Bartram spoke of "we" or "they" as discovering such wonders, and Franklin in his early letters to Collinson wrote always of what "we" had done or learned He specifically spoke of Thomas Hopkinson as first observing the "power of points to *throw off* the electrical fire" and of Philip Syng as contriving a sphere mounted on an axle to save the labor of rubbing a glass tube Ebenezer Kinnersley, who contributed much more than either Hopkinson or Syng, seems not to have joined Franklin and his associates in these studies till their second year (1748)[51] There is no possible doubt that Franklin was the master in their researches, as he was the most masterly in his accounts of them Though his skill as a writer helped make his name unavoidably stand out, his letters of 1747 gave credit to all his fellow-members who took part in what were long and often called the "Philadelphia Experiments"

These were actually the first fundamental achievements of the Society which Franklin had proposed, as his letters to Collinson were essentially such communications as he had hoped the Society would make to the world of science The fulfillment of his plan had simply not come in the forms he had expected Hitherto an impresario of scientists, he now became the chief scientist of them all. Too much absorbed in special studies to keep on urging the languid Society to organized effort in general fields, he left it to drift further into disuse. He gave up his scheme for a Philosophical Miscellany He even turned aside, after a few months, from his original investigations to services in defense of the province in the war that threatened Philadelphia with attack or invasion in the summer of 1747 His public duty was a stronger passion with Franklin than his private curiosity "Had Newton been Pilot but of a single common Ship," he wrote to Colden on October 11, 1750, "the finest of his Discoveries would scarce have excus'd, or atton'd for his abandoning the Helm one Hour in Time of Danger, how much less if she carried the Fate of the Commonwealth."[88]

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[47] Franklin, *Writings*, Smyth ed, 1 417

[48] Franklin, *Writings*, Smyth ed., 2 301

[49] Franklin, *Writings*, Smyth ed, 2 302.

[50] Colden, *Letters and Papers* 3 363

[51] Franklin, *Writings*, Smyth ed., 2 304, 306, 310, 397, 1 417.

Without an active secretary the American Philosophical Society seems to have held no more meetings, elected no more officers, done as a group no more work It had not run its course, for it was later capable of being revived But it had with apparent unconcern let the first chapter of its history come to an end

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[88] Colden, *Letters and Papers* 4 227

16FEB 1949

SYMPOSIUM
on the
ORGANIZATION, DIRECTION, AND SUPPORT OF RESEARCH

Papers read before
The American Philosophical Society
Autumn Meeting
November 19–20, 1943

PHILADELPHIA
THE AMERICAN PHILOSOPHICAL SOCIETY
INDEPENDENCE SQUARE
1944

CONTENTS

The Advancement of Learning in the United States in the Post-War World 291
James B Conant, President of Harvard University

The Organization, Direction, and Support of Research in the Physical Sciences 299
Hugh S. Taylor, Princeton University.

The Discovery and Interpretation of Biological Phenomena 307
Detlev W Bronk, University of Pennsylvania

A Critique of Medical Research 313
Alan Gregg, Rockefeller Foundation

Discussion on the Symposium "Organization, Direction, and Support of Research" 321
Karl K. Darrow, Bell Telephone Laboratories

Political Economy in the Modern State 323
Harold A Innis, University of Toronto

War and Historiography 342
Robert Livingston Schuyler, Columbia University

Merchants of Light Scholarship in Arts and Letters 352
Marjorie H Nicolson, Columbia University

War and Research in Social Science . 361
Roy F Nichols, University of Pennsylvania.

THE ADVANCEMENT OF LEARNING IN THE UNITED STATES IN THE POST-WAR WORLD

Franklin Medal Lecture, November 19, 1943, in Symposium on the Organization, Direction and Support of Research

JAMES B CONANT

President, Harvard University

It is a great honor to have the privilege of giving the Franklin Medal lecture The subject I have chosen is highly academic, but for this I offer no apologies to a distinguished audience The matters which I shall treat are primarily of concern to scholars, yet, as I shall attempt to demonstrate, their implications affect the lives of all the citizens of this republic And conversely, the attitudes and actions of the lay public will determine to no small degree the future of the world of scholarship. In short, my remarks tonight are in the nature of a footnote—an American footnote—to a discussion of the problem of the relation of Society to Scholarship, or if you will, of the Scholar to the Nation

I

It is clearly impossible to discuss the Advancement of Learning in the United States without making some assumption as to what these United States will be like in the next two decades For example, if by some miracle Hitler should succeed in forcing a stalemate, the omens would not be auspicious for the advancement of learning or for many other human activities—quite the contrary We should be living in an armed camp, the authority of the Federal Government would be paramount, and the national policy would be largely determined by military necessity. Except in certain specialized fields, knowledge would not advance Similarly, if a period of social crisis were to be followed by a highly regimented society, the advancement of learning would soon fail to prosper. Under such conditions, whether the strong arm of government were swung from the right or from the left, the effect would be the same; an official doctrine would cast an ominous shadow of fear over all discussion; dogma would take the place of free inquiry.

There is no need to labor the point Those who have eyes to see or ears to hear know what has taken place across the oceans, and they tremble when they visualize the impact of society on science, or rather they tremble when they realize the effect of the impact of certain types of society on science and learning

But history shows us that it is not only modern totalitarian societies which put learning in a straitjacket There are insidious poisons which may arise from every pore of the social structure and without benefit of the police or a "party line" suffocate the human urge to know and to understand. I venture to remind you of Gibbon's classic description of the highly stratified society of Byzantium

> They held in their lifeless hands the riches of their fathers, without inheriting the spirit which had created and improved that sacred patrimony they read, they praised, they compiled, but their languid souls seemed alike incapable of thought and action. In the revolution of ten centuries, not a single discovery was made to exalt the dignity or promote the happiness of mankind Not a single idea had been added to the speculative systems of antiquity, and a succession of patient disciples became in their turn the dogmatic teachers of the next servile generation.

If the United States of the 1950's and 1960's is on the road to a civilization like that of the Byzantine Empire, or like that of certain totalitarian nations in the 1930's, there is no use in discussing the advancement of learning For the phrase no longer has the meaning given to it by Francis Bacon, it no longer carries those implications which have raised the hopes of countless men and women who have echoed his words through more than three centuries of ever-increasing liberty

There can be no escape from the conclusion that if we are to talk about the advancement of learning, we must postulate the continuance of a free society Can we accept such a postulate for the United States in the years ahead? I believe we can without hesitation I say this in spite of the apprehension of many (which I share) as to the effect of the trend of this century towards collectivism, a trend reinforced by the demands of war

I make this confident assertion as to the continuance of a free society because I believe we shall win not only the present war but the subsequent second battle for freedom This second battle for freedom will start when the military might of Germany and Japan has been overthrown. It will be a battle not of planes or tanks or ships, a battle not of men against men but of a nation against threatened calamity. It will be the fight of a free people to continue along their historic line of development, a free people committed to the ideal of a fluid society with equal opportunity for all It will be a fight to maintain a truly competitive system based on individual initiative arising afresh in each new generation. It will be a fight to make a competitive capitalistic system work in spite of the complexities of modern industrial life—to make it work, furthermore, in the face of the apparently overwhelming obstacle of the demobilization of a military undertaking which staggers the imagination

I believe we shall win this second battle for freedom by keeping our blood pressure down and our chins up, we shall succeed by continuing the spirit of national unity achieved in time of war, by putting the nation's welfare ahead of personal desires, by clear and quick thinking on the part of experts and leaders alike even in the face of what some may proclaim to be "imminent disaster" And I believe we shall come out of this second battle for freedom without having witnessed the violence of revolution or counter-revolution and without having broken the continuity of our tradition.

We in the United States are the heirs of both the American and the French Revolutions Nowhere else in the world have so many men for so many years acclaimed the ideals which are expressed by such phrases as "liberty, equality, fraternity" and "life, liberty, and the pursuit of happiness." Nowhere else in the world have the slogans, "equality of opportunity" and "there are no classes in this country," expressed national ideals from which few ventured to dissent Yet all who are not vainly trying to live in a past century know the force of a terrible question which has been raised throughout the western world—the question, how can these democratic ideals be in fact made a reality for the many, when vast economic power is wielded by a few We shall evade this question at our peril. For it is only by facing it squarely that we shall find the answer; and it is only by finding the answer that we shall evolve a uniquely American civilization which will be, indeed, the promised land for those who would be adventurous and free

II

Free inquiry—these words sum up, as well as any, the necessary condition for the advancement of learning in any age The scholar must be free He must be free both from intimidation and from control by government He must inquire and speculate with as few restraints as possible. Yet history shows that the advancement of learning has not proceeded in a social vacuum In those times when the advance has been most spectacular, when groups of eager young men pressed forward in a new direction, there were strong forces at work which determined to some degree the objectives on which men of learning set their eyes No one familiar with even the outlines of the record of the advancement of learning in the last three centuries can doubt that fact.

A controversy has been in progress during the last decade, however, as to the variety and kinds of social forces which have conditioned the behavior of scientists and scholars This controversy stems from the application of the orthodox Marxist doctrine to an historical problem, namely, the relation of science to society According to the Marxist view, "science is the product of the economic conditions of society, and its social function is to benefit the ruling classes of society" When applied to the work of Sir Isaac Newton, for example, this interpretation of the past leads to the somewhat startling statement that "Newton was the typical representative of the rising bourgeoisie, and in his philosophy he embodies the characteristic features of his class" Furthermore, we are asked to believe that the scheme of physics with which he was concerned "was mainly determined by the economic and technical tasks which the rising bourgeoisie raised to the forefront." And the proponents of this twentieth century doctrine are ready to laugh out of court any who prefer a more heroic reading of the history of science; they will throw in their faces with a jeer Pope's famous lines.

> Nature and Nature's laws lay hid in night;
> God said "Let Newton be!" and all was light.

But the sin of oversimplification may not lie entirely with the eighteenth century poet. This is made evident by a critique of the Marxist position from the pen of a distinguished historian, Professor G. N. Clark, in a small volume on *Science and Social Welfare in the Age of Newton*. But the discussion continues. Two brilliant scientists of Great Britain line up on opposing sides. Bernal's *The Social Function of Science* is answered with vigor by Polanyi's "The Rights and Duties of Science" in his book, *The Contempt of Freedom*.

As one interested in the history of science, I hope the debate will continue. But it seems evident that the economic interpretation of the history of science no less than the economic interpretation of general history can be pushed to absurd and extravagant lengths. The progress of pure science, for example, has been clearly in part a response to utilitarian stimuli. However, it is easy to show that this is not the whole story. Even the relation of science to industry, for example, is a highly complex affair. As I suggested here in Philadelphia last winter, neither the scientist nor the industrialist has been a parasite, the one living on the other. Rather, we are dealing with a case of symbiosis. If this be so, the healthy advance of physics and chemistry in the future will be assisted by a clear recognition of the symbiotic relation which these sciences bear to progress in technology.

Even when we consider only the field of experimental science, it seems evident that social forces other than economic have played an important role in relatively recent times. For example, the foundation of the Royal Society was closely connected with English Puritanism during the Cromwellian period. One can even make a very plausible case, following the lead of Max Weber, for a relationship of cause and effect between dissenting protestantism in general and the urge to follow Bacon's advice and advance learning for both godly and material reasons.

If the scientific movement in England in the seventeenth century came largely from dissenting and rebellious quarters, English scholarship in the field of history after the Restoration was the beneficiary of the opposing current of orthodoxy and loyalty to the Sovereign. A concern for the historical foundation of the Anglican church and doctrines led a number of ardent royalists to become great scholars. But this type of motivation is, of course, a recurrent factor in the history of scholarship. From the Middle Ages until the eighteenth century, theological controversy, philosophical inquiry, and the study of antiquity were almost inseparably interwoven.

In short, as we view the advancement of learning over a considerable span of time, the ivory tower seems conspicuous by its absence. The scholar may imagine that he is as free as a pioneer in a virgin forest, yet those who trace his wanderings from a distance can discern the effect of many varied social forces. Indeed, it would be my contention that certain types of strong social forces must play upon the world of scholarship if the spirit of learning is to live and flourish. Paradoxically, free inquiry must be powerfully polarized if inquiry is to prosper. This will be particularly true, it seems to me, in the highly industrialized age which lies ahead. For if free inquiry is but an aimless, leisurely ramble amidst delightful scenery, it is likely to become an occupation only for the old and intellectually infirm.

Professor Bernal warns that "whatever the scientists themselves may think, there is no economic system which is willing to pay scientists just to amuse themselves." I am not so sure. The cost accounting methods of a democracy are not as penetrating as he assumes. But I do feel sure that if one attempts to justify a scientific or scholarly activity solely in personal hedonistic terms, the effect on the incoming recruits will be disastrous. Is it not clear that if scholarship and pure science are to flourish in a democratic, technical society, such enterprises must be alive and vigorous? Is it not evident that they must be a part and parcel of the great adventure of the day? Only then will the ambitious, energetic, and imaginative young men of each generation be attracted to the academic and learned world. And it is on the recruitment of the next generation of scholars, I may remind you, that the future of each age of scholarship depends.

From all this I am sure no one in the audience will dissent. A debate might well develop, however, if we were to try to distinguish more closely between those forces which may polarize the field of learning disadvantageously and those which are beneficial in their action. The Marxists among you, if there be any, would certainly make free use of the idea of social utility and would not be too much worried if society rather frequently demanded an accounting from the scholar in those terms. Others among you would both repudiate the validity of the test of utility and be shocked by any suggestion of an accountability of the world of scholarship to those who stand outside.

Personally, I view the question not primarily in terms of the degree of coercion of the scholarly by the masses; but rather as a problem involving the quality of the appeal that the scholar can make to the brilliant and enterprising sons and daughters of those who constitute the masses And I think this appeal should be couched neither in utilitarian terms nor in those appropriate to a secluded retreat where the academic equivalent of the slogan, "art for art's sake," is the official doctrine Rather, it seems to me that in each area of the entire field of learning the activities under way must be manifestly relevant to the future of our civilization The undertakings must be relevant not only to man's physical and social needs but to his highest hopes and aspirations Relevance, not utility, therefore, I submit is the touchstone to test the vitality and validity of a scholarly enterprise—relevance to the future as we envision it

III

To illustrate how the relevance or lack of it in scholarly undertakings may be assessed, it is essential to deal separately with widely different types of intellectual activity For this purpose the conventional academic divisions are quite unsuitable Therefore, I propose to follow Francis Bacon in trisecting the whole field of learning, but to take great liberties with his definitions

In the second book of the *Advancement of Learning*, Bacon wrote as follows

"The parts of human learning have reference to the three parts of man's understanding, which is the seat of learning history to his memory, poesy to his imagination and philosophy to his reason"

Three centuries of the very activity for which Bacon was pleading throughout his famous treatise have made his classification now inadequate In the twentieth century we have a vast fund of knowledge accumulated by the labors of historians, archaeologists, experimental scientists, and observers of natural history We roam freely in fields of which the author of the *Advancement of Learning* never dreamed And we are confident that the process of expansion has far from reached the end With Mr Churchill we can believe that "the empires of the future will be empires of the mind."

Looking back over the journeys of the pioneers who opened the new vistas for us, we can speak with assurance of the advancement of learning. Indeed, here and there we can even hazard an opinion as to the rate of progress and complain about those times and places when it seems unduly low. Seen in historical perspective, many products of man's memory and reason must be classified together. From this point of view the labors of a dozen generations of experimental philosophers are clearly more closely related to archaeology than to what is now embraced by the term philosophy Mathematics, likewise, has undergone a similar development

Bring back to life a student of antiquity of a century or two ago and confront him with the present status of archaeology and ask him whether or not learning has advanced Can there be any doubt as to his answer? Repeat the hypothetical operation in physics or biology or mathematics and ask the early investigator whether or not he would have counted himself blest by fortune if he could have stood where his successor stands today I may remark parenthetically that this imaginary operation can be performed with considerable assurance, using much shorter intervals of time and more restricted areas of interest By so doing one can give meaning to the word progress as applied to intellectual undertakings

We would do well, therefore, to merge portions of Bacon's two classes (his first and third), history and philosophy, into one which we may designate "accumulative knowledge" In this area we can speak of the advancement of learning and indeed apply such tests as I have suggested to see whether or not learning has advanced over the course of the last few generations We can even estimate the chances of further rapid progress on a given restricted front And such estimates are of profound significance in regard to this question of the relevance of scholarly activities For in a free democratic society dedicated to the preservation of the dignity of the individual, I believe a true advance in learning will always be considered relevant Quite apart from any idea of utility (however we stretch the word), I am convinced that intelligent men and women in the sort of America I have dared envisage for the 1960's will be ready to cheer each new step forward; they will be ready to acclaim the acquisition of new territory by the "empires of the mind."

But let us be quite certain that we do not mistake the mere acquisition of information for an advance in knowledge For the piling up of new facts may or may not be relevant to future intellectual progress or to society's needs All who are familiar with the history of the physical sciences know that there has been a tremendous amount of thrashing around in the underbrush even during those times when giants were hewing out dazzling paths through the virgin forests. Or to vary the metaphor, we are all aware of how many scholars have continued to dig assiduously but unprofitably in exhausted mines All of which is inevitable and trivial except when loyalties and traditions urge men to claim either that digging is a worth-while activity in and for itself, or that the yield from an exhausted vein is full of gold

It is at this point that the argument between "science for science's sake" and social utility begins It may soon degenerate into an argument for the continuation of a particular line of intellectual activity merely because this has once been a fruitful direction of adventure The argument soon becomes an emotional defense by those who love the field in question and who endeavor to support their loyalty by an appeal to general principles of the sacredness of all knowledge At this point young scholars start leaving the academic halls Society becomes impatient And rightly so

IV

Let me now turn from the first category—accumulative knowledge--to the other two which, following Bacon closely, I shall designate as poesy or, if you prefer, poetry and philosophy Whereas the idea of progress is both valid and significant in the first category, accumulative knowledge, in the other two the concept is not only invalid but a positive deterrent to relevant undertakings And at this point, lest all but scientists, mathematicians, and archaeologists leave the room in protest, I hasten to assert that I place no halo over the word progress There is no hierarchy implied in my classification

Indeed, anyone who wished to give poetry or philosophy an inferior place as compared to accumulative knowledge would soon find himself in an untenable position For it is obvious that poesy or poetry on the one hand and philosophy on the other together hold the keys to man's immediate future, including the future of the advance of accumulative knowledge. That this is so, current history provides ample proof Nazism triumphed in Germany not because the Germans were lacking in power to advance learning but because bad poetry and a wrong philosophy prevailed. Remember that unless we are to have a free society there will be little chance for progress in understanding of the world of animate and inanimate nature in which we live. And yet this progress or the lack of it will affect only slightly the freedom or the lack of it in the United States in the post-war years. On the other hand, the ideals, the hopes, the ambitions as well as the doubts, the anxieties, and the fears of millions of men and women may well prove decisive And these thoughts and emotions are largely conditioned by the poetry and philosophy of the day

There are countless vexatious questions which must be daily answered by each of us as individuals and collectively as a nation, and for which there are as yet no answers provided by our fund of accumulative knowledge Considerable nonsense is often talked about applying the scientific method to social problems What is this scientific method? The usual philosophic inquiries into the question seem to me a bit unreal when one surveys the range of methods actually employed by sciences as remote from each other as geology, systematic botany, organic chemistry and mathematical physics Perhaps science is after all only organized common sense, preferably derived from experiment and preferably organized on a quantitative basis

Perhaps by the scientific method one means only an impartial examination of a situation, an honest attempt to use rational powers to analyze complexities If so, the phrase is badly chosen It blinds us to an important distinction between situations where value judgments are by necessity involved and those where they can be eliminated from the frame of reference Only in the latter case are methods comparable to those used in the advancement of knowledge really applicable Yet the difference between disciplined and well informed judgments involving values on the one hand, and on the other extragavant and ignorant opinions, is the difference between civilization and barbarism

One of the chief ends of education is surely to develop the capacity for making civilized judgments on all those matters of value which are involved in so many vital human decisions Such judgments can be illumined often by our knowledge of the past experiences of the race, but they are largely determined by emotional reactions and channels of thought whose pattern by necessity varies from age to age It is thus the poetry and philosophy of the present, rather than accumulative knowledge, which play the significant role in outlining the next act in the drama of world history

If we use the term poetry to cover all creative insights into human destiny whatever their form may be, and the word philosophy to include the whole expanse of analytical and speculative thought except for mathematics and the sciences, we see that many aspects of a scholar's labors fall within these bounds Together with accumulative knowledge these two classes comprise the field of secular learning All matters closely related to religious faith must form a fourth category. With their relation to society and the scholar, I do not propose to deal tonight For, in the phraseology of Bacon, I am not trespassing on the field of divine learning, but confining myself entirely to that of human learning

With this limitation, all the usual fields of scholarly activity are included in the three categories I have named accumulative knowledge, poetry, and philosophy Many cut across two and even all three. For example, history as an interpretation by the present of the past must rest on accumulative knowledge, but consciously or unconsciously reflect the philosophy of the writer, and it has been said more than once that every great historian is not only a historian but a poet In general, the humanities and the social sciences, to use our modern terms, cut across all three fields, and only rarely does the major part of a traditional subject fall within the boundaries of accumulative knowledge For this reason it would seem a grave error to treat these disciplines as though the increase of accumulative knowledge (an advance in learning) were the significant aspect of the undertaking Only in a very few instances is that true today, in my opinion

The significance of poetry and philosophy is not to be measured in terms of progress or advance Try, for example, my imaginary operation of bringing back to life great figures of the past We can hardly doubt how Galileo, Newton, Harvey, or Winckelmann would respond to a glimpse at the contemporary answers to the questions which they raised It is far otherwise with Michelangelo, Rembrandt, Dante, Milton, or Keats. It is far otherwise with Thomas Aquinas, Spinoza, Locke, or Kant You and I might argue until midnight whether or not the particular artist or poet or philosopher would feel that the present state of art or poetry or philosophy was an advance or a retrogression from the days when he himself was a creative spirit. There would be no unanimity among such an audience as the one I am addressing tonight; and more significant still, no agreement between the majority view which might prevail here and that which would have prevailed in a similar gathering half a century ago.

We are not dealing with accumulative knowledge when we speak of poetry or philosophy We are dealing with something far more vital, in a sense far more practical; something that affects for better or worse the ambitions and the conduct of civilized man. The advance of learning is here a trivial matter, relevance is tested by the ordeal of battle. New disciples will flock to those masters who sit not in an ivory tower or with their vision fixed on a by-gone day, but who endeavor to understand and interpret the scene that unfolds year by year before their eyes, or to those others who, alive to the significance of the present, seek to bring nourishment and enlightenment from the wisdom of the past

It has been well said that a poet's garden should be not in the market place but hard by. By the same token, a university—the home of scholars—should be bounded by both the market place and the poet's garden This location presupposes, of course, that there will be ample opportunity for communication over the academic walls The philosophers and those who seek to advance learning, I assume are largely academicians How much they should also be either poets or active in the market place is an open question. As far as the accumulation of knowledge is concerned, the problems involved are rather superficial The relation between pure and applied science can be adjusted with little difficulty and to the mutual advantage of both the progress of science and the welfare of society

The same is true of those aspects of social science which are clearly concerned with accumulative knowledge. But when we come to the more usual case, where large elements of philosophy and some poetry are admixed, the situation alters. Since the relevance of such undertakings depends on their relevance to the ideals of the future which arise from the maelstrom of the present, one can maintain that the social philosopher must travel constantly between the market place or forum and the academic halls.

On the other hand, a well-known economist has expressed the view that

> the service of social science and the practice of the arts of democratic government are vocations each of which may be pursued with sincerity and singleness of purpose, but they cannot be combined. A social scientist cannot become a politician by speech or writing or affiliation without losing value as a scientific investigator and a teacher. Without derogation from essential academic freedom, those who choose the academic vocation in the social sciences should impose on themselves reticences and self-denials in the political and practical field, which would not be necessary for teachers of other subjects, but are necessary

to give to the social scientist that emotional detachment from his subject which comes naturally to the biologist or chemist

It may be a surprise to many to learn that the author of these words is Sir William Beveridge The quotation is from his farewell address to the London School of Economics in June, 1937 The sentiments expressed are directly contrary to what is current practice both here and in Great Britain Which view is right?

I wonder if the answer is not to be found in the distinction I have endeavored to maintain between accumulative knowledge and philosophy If we call those whose aim it is to advance learning scientists (though this is bad nomenclature), then if a professor wishes to be a social scientist he may well follow Beveridge's admonition If, however, he is a social philosopher and wishes his thinking to be germane to the problems of the day, he can hardly fail to become identified with politics from time to time—that is, he will take a position that results in his being affiliated in the public eye with an issue which has become political In a sense he is an applied scholar and his political activity is as much a measure of his stature as the corresponding field activities of an applied scientist or engineer

The difficulties seem to me to arise primarily because confusion reigns over what is social science and what social philosophy Or, perhaps, more often the confusion arises because a given professor endeavors to be at the same time a social philosopher and a social scientist I think the academic world needs both, but I doubt if they can be combined in a single individual for the reasons Sir William Beveridge has pointed out Furthermore, I think the distinction between the two types of individuals might well be made explicit with advantage to both the public and the universities.

I have assumed that a major share of both advancing learning and fostering philosophy will be the responsibility of the universities in the years ahead Research institutes will, of course, also play an important part, particularly in the applied sciences including medicine But by and large the more fundamental the scholarly or scientific work, the more difficult it is to provide for it in advance. The exceptional man turns the unexpected corner in ways which cannot be foreseen No one can designate the targets in advance. This fact makes difficult the organization of research even in applied fields. It practically makes impossible the planning of research in other areas The scholar must be a free agent and may or may not be productive This being the case, it is unlikely that society will foot his bills hence a large share of scholarly undertakings must be coupled with another activity, namely, professional teaching And the organization of our universities must be kept as flexible as possible if they are to serve the nation as they should Whenever we are fortunate enough to see a man of genius emerging, he should be given the greatest possible scope within a university The usual academic compartments should not confine him either in his relation to the students or to the investigation which he has in mind

Our scholars will be teachers I except only the fields of applied science, including medicine I base this prophecy on the past history of the methods by which society has supported the advancement of learning even in times of unqualified enthusiasm But whether or not the combination of professional education with scholarly endeavors is the most likely way of financing the latter, is it not essential that our intellectual leaders be in close contact with the most promising youths of the oncoming generation? There is no other way in which we can be certain that the current of intellectual adventure will continue to flow vigorously ahead

In the United States we have many different types of institutions of higher learning This is fortunate for several reasons In the first place, we can rest assured that only drastic action could enforce a regimentation In the second place, the number and variety of our universities spell assurance that there will be intensive competition This in turn means we shall continue to provide adequately by one means or another for exceptional scholars and brilliant teachers These two advantages are great, indeed, and far outweigh the evils inherent in the inchoate educational system which to outsiders seems often both inexplicable and thoroughly unsound

The great flame of war which has seared all of Europe places heavy responsibilities in our hands. A large share of the future of the scholarly activities of the world must be carried on in the next decade on this continent To meet this challenge we need invoke no powers of the Federal government, nor embark on a vast program of building special institutes for scholarly undertakings We need not organize into a hierarchy our institutions of higher education We need only make certain that to foster the spirit of free inquiry shall be an ambition of the American people.

We need ask only that the nation support our diversified American universities, not only as educational institutions but as communities of scholars. If the response be favorable, for the rest we need have no fear

V

Now in conclusion, may I say just a word in answer to the obvious criticism that in trisecting the field of intellectual activity in a new and arbitrary fashion I have destroyed the unity of the ancient society of scholars. To my mind, the unity of the world of pure learning (including science, philosophy, and as much of poetry as the writers, artists, and poets will allow) is based not on a common method but on a common motivation Perhaps, I should rather say dedication For the scholar, the seeker after truth, whether he be mathematician, archaeologist, scientist, philosopher, poet, or theologian, must come into the court of public opinion not only with clean hands but with a consecrated heart He must have integrity of purpose, a disciplined imagination, and the power of critical analysis of both the problem at hand and his own contributions. In addition he must have high standards of performance as to the technical aspects of his task.

His rewards are not measured in terms of material riches or the satisfactions which to many men are most enduring. For him neither wealth, nor power; neither the happiness which comes from contributing immediately to the public welfare, nor the exhilaration of being one of the builders of an expanding industrial age Unlike the applied scientist or the social philosopher who is in the arena of active life, he will know little of the extremely unscientific problems involved in the management of men His ambition as a scholar, a philosopher, or a poet will be merely to seek the truth with all the skill and power at his command. This he will do humbly and yet with joy and pride For without exalting his calling above that of others, he may nevertheless hope that from his labors will issue something that the "world may not willingly let die."

THE ORGANIZATION, DIRECTION, AND SUPPORT OF RESEARCH IN THE PHYSICAL SCIENCES

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(Read November 19, 1943, in Symposium on the Organization, Direction, and Support of Research)

THE ORGANIZATION OF RESEARCH

The American nation is in process of assuming, through the power of her military, naval, and air forces, and the technological organization requisite to that power, a position of major responsibility for peace and civilization in the post-war era. Adequately to meet the commitments which such a responsibility entails, the United States will, of necessity, be forced to enlarge both political and social horizons and at the same time to develop, to a degree hitherto unrealized, the scientific bases which that enhanced influence in the counsels of the world will, in large measure, require

The progress of science and the technological changes that have resulted therefrom have proceeded with auto-accelerating pace over the last thirty years Some concept of what the coming decades may hold can be learned from the history of this country during World War I and the inter-war years with respect to scientific achievement, and the pattern there revealed will be a miniature of what must inevitably follow from the revolutionary changes in technology that the present war has produced In 1914 American science looked to Europe for leadership. As Dr C M Stine noted in an address to American chemists one year ago·

> It was a simple, almost a scientifically primitive economy in which we Americans then lived. On all the seven seas, America-bound ships heavy with goods and raw materials testified to our dependency on foreign lands The homes in which we lived differed little from those of our great-grandfathers, the tailors of the Caesars knew the textiles of which we made our clothes, the finishes of our 1914-model horseless carriages dated to ancient Egypt and the building of the Pyramids All steel rusted. The best rubber tires were worn out after about 3,000 miles of highly uncertain road service
>
> One shudders at what might be our plight if those were the tires of today, or if by some colossal blunder we had failed to establish an organic chemical industry in the United States as a consequence of that other war's bitter lessons.
>
> Thank God, we did establish a chemical industry!
>
> We did more than that We established a nation-wide common consciousness of the power of science in every branch of American industry Steel, textiles, transportation, foods, oil, in fact every basic producer, came to the turn in the lane where all signposts of progress pointed in one direction—to the research laboratory We did not get there all at once, but most of us got there long before German hob-nailed boots were pounding over the streets of Warsaw.
>
> Expenditures for industrial research in the United States rose from an inconsequential sum yearly in the pre-World-War-I period, to an amount estimated at $300,000,000 yearly in the pre-World-War-II period. The number of research laboratories grew to more than 2,000 Huge sums were spent in expanding technical and scientific schools to meet the demands of our awakened youth The number of doctorates granted in chemistry alone was multiplied by 20 or 30 times

Similar if less immediate changes occurred in the science and technology of physics with advances in communications and transport, based upon electronics and aerodynamics, reaching a tremendous pace of growth only within the last few years Mathematics, pure and applied, shared in the effort and took its part in the scientific and technical educational task that was required. Immediately after World War I, when the impact of war had revealed the necessity for expanded training in science, the Rockefeller Foundation initiated through the National Research Council in Washington a series of post-doctorate National Research fellowships in astronomy, mathematics, physics, and chemistry. These fellowships aimed initially at the building up of a scientific personnel from which the required enlarged body of college and university science professors could be drawn The record shows abundantly how this was in large measure accomplished, and in our present stress we can see how far-sighted the policy was and how much today we lean for leaders upon the men so trained

Industry also found that the available number of graduate students was inadequate to the demands of rapidly expanding programs of industrial research and itself took a hand in stimulating the supply The E. I. du Pont de Nemours Company initiated such a venture early in 1922 To a selected group of universities with good reputations in chemistry, the company offered to the department of chemistry a fellowship at the graduate student level without any restrictions as to choice of fellow, nature of the research work pursued, or ultimate ambition of the student selected The aim was frankly to increase the number of students pursuing work for the doctorate in chemistry. The philosophy behind the fellowships was that, ultimately, an increase in the number and quality of graduate students in chemistry would mean an improved research personnel in their own laboratories The example of the du Pont Company has been widely imitated by other chemical organizations. In physics, the policy has been notably less evident, but the current demand for research men in physics suggests that a similar intensive development of graduate students is due

The universities themselves have contributed generously to the expansion of research personnel by the system of part-time assistantships Here, also, owing to larger elections in the chemical field, the expansion has been greatest in the departments of chemistry, but the current demand for physicists and the probability that it will continue suggest that a similar measure of expansion is at hand in physics. It is via this path that many of the research personnel in industry and university have obtained their training for the doctorate in America, at least during one or two years of their training period It is largely from the ranks of such assistants that the best are drawn to fill fellowship vacancies in the final years of study and research where freedom from other obligations constitutes a prime asset.

The growth of the educational supply to meet the research demand has led inevitably to steady improvement in the quality of educational and research activity in American colleges and universities in the inter-war years. American science and scientists have, in the main, been prepared for the tremendous calls that the present war has laid upon them Leaders in the scientific effort have received a generous measure of support from educational foundations There has grown up as a result, in and out of the universities, centers of research devoted to a group of connected problems. Dr. C. E K. Mees, of the Eastman Kodak Research Laboratories, classifies such laboratories "as 'convergent' in distinction from the more usual 'divergent' laboratories, in which problems of many kinds are studied" Such a laboratory of the convergent type may well be described, Dr. Mees believes, as a "research institute," and it is this type of research institute that he expects to be the most important of the agencies for the production of fundamental science in the future. The research institute is a growth of the last half-century in the organization of research. It has grown out of the specialization of investigators, generally at universities, in some field of work important enough to attract students to the field and resulting finally in the establishment of the laboratory in question as the center for research in the subject Abroad and at home many examples may be cited. The Cavendish laboratory at Cambridge, under J J Thomson for the study of the electron and under Rutherford for radioactive and nuclear studies, the Leiden laboratories under Kammerlingh Onnes for low-temperature research, are examples from universities abroad The Kaiser Wilhelm Institute for Physical Chemistry in Dahlem under Haber is an example of a research institute that grew out of foundation foresight and generosity The Geophysical Laboratory at Washington and the Mount Wilson Observatory are research institutes in this country established by the Carnegie Institution The grant by the International Education Board for the 200-inch telescope on Mount Palomer, California, and the appropriation by the Rockefeller Foundation to the University of California for the construction of the giant cyclotron designed by E O. Lawrence directly tend to make of these centers research institutes of the type under consideration.

To a lesser degree, over the whole country, monetary grants in support of promising research work and research men are producing research institutes convergent rather than divergent in nature, within the framework of existing universities or as separate organizations with some degree of affiliation with college or university. We may cite in this connection the Institute of Paper Chemistry at Appleton, Wisconsin, and The Institute of Gas Technology with headquarters in Chicago. The American Petroleum Institute has made Ohio State University the headquarters of research effort which also provides materials for research work in many institutions. The American Petroleum Institute for many years has sponsored a large program of research in the United

States Bureau of Standards in Washington. This is true, also, of the Textile Foundation, and from this research effort may spring a central institute for fundamental research in textiles, affiliated with some educational foundation Cellulose chemistry, the chemistry of starch and of sugar, are examples of other research efforts which may mature into research institutes of the type here under discussion. Some of the industrial research laboratories can indeed be described as research institutes The research laboratories of the Eastman Kodak Company at Rochester can be cited as a Research Institute for Photography. The research laboratories of the General Electric Company at Schenectady, of the Bell Telephone Company at New York City and Summit, N J, and that of the Westinghouse Company at Pittsburgh, Pa, rate high among the research institutes of the country In this last case, the institute aspect of the enterprise has been emphasized by the short-term fellowship scheme for post-doctorate research men that the Westinghouse Company has sponsored. The regional laboratories of the United States Department of Agriculture, with laboratories devoted specifically to research in the principal agricultural products of the East, South, Central and Western areas of the country, are government-sponsored research efforts of the research institute type

In England, there are parallel developments Under the Department of Scientific and Industrial Research there are organizations such as the National Physical Laboratory and the Government Chemical Laboratory, and also a number of industrial research associations notably in cotton, wool, and silk. The British Rubber Producers Research Association sponsors a broad program of fundamental research on rubber. The Fuel Research Board has conducted a comprehensive program on liquid fuels during the years between the two World Wars, and plans for fundamental research on coal have developed during the present war years. Naturally, under the stress of war requirements, the scientific establishments, in England as here, devoted to the special problems of war urgency have multiplied considerably

It is a matter of universal experience that the conduct of warfare, on the scale and with the equipment that modern technology has made possible, requires a tremendous research potential behind the actual military forces. It is not surprising, therefore, in the light of the achievements of the Russian forces during the last two years, that, in Russia, can be found the most extensive planned development of the research institute. The organization of these institutes has been described by J G Crowther in his book, *Soviet Science* They stem from the Russian Academy of Sciences, and, under separate committees of academicians and associates, various groups of institutes are organized in each field of science Among the more notable of these are the Academy of Agricultural Science, with N I Vavilov, the eminent geneticist, as one of its outstanding members, the Physico-Technical Institute directed by Joffe, the Institute for Chemical Physics, associated with N Semenov, and the Optical Institute, the three last with headquarters in Leningrad, the Karpov Institute of Physical Chemistry at Moscow, and many others. The year 1942 gave Russian Soviet science a welcome opportunity to summarize the progress which had been achieved in 25 years from the Revolution in 1917 In this process of self-examination it was, in one place, concluded without hesitation

> that Soviet science does not lag behind scientific achievements in other countries and that Soviet scientists are leaders in many branches of science
>
> The original plan for expansion of the chemical industry during the third five-year plan (1938–1942) which provided for a 237 percent expansion of chemical industry is being stressed. The war did not decrease the scope of this development It only brought forward the practical requirements of the day

In addition to steel, non-ferrous metals, and the heavy chemical industry, petroleum, synthetic rubber, plastics, and the synthetic fibre industry were all included in the scope of the plans The research effort by 1941 had resulted in 40 special chemical research institutes, 70 chemical and chemical engineering schools or departments in technical colleges, with from 35,000 to 40,000 students and some 5,000 chemists and chemical engineers graduated each year The losses sustained in the initial year of war were compensated "with a substantial margin" by evacuation and resumption of work in research institutes, colleges, and industrial establishments in the eastern territories of the Soviet Union.

Institutes of the type here considered can be in no sense regarded as substitutes for the industrial research laboratory These latter are essential if the new developments in fundamental science are to be translated into industrial processes and products. The research institute must be regarded, with the university research laboratory, as the principal source of that body of fundamental science which the industrial research laboratory will bring into practical application. The energetic demands for applied science now with us due to war have only served to show, in sharper focus, how the solutions of desired industrial problems are oftentimes delayed by gaps in our fundamental knowledge In the solution of pressing war problems how often have we to lose time in learning the science underlying the desired application The industrial laboratory must look in large measure to the university and research institute, even in normal times, for such basic data The advantage which industry would reap therefrom would lie not so much in the immediate returns from the fundamental research but in the speed and economy of effort with which industry can utilize such effort in the solution of its own practical problems The contrast between American technology in World War I and today, in the volume of technical effort that it can put forth and in the speed with which new problems can be solved, is undoubtedly due to the great growth of fundamental science in this country in the inter-war years.

There is another aspect of the problem of organization for scientific research in the post-war world that is so comprehensive as to be outside the scope of our present considerations but nevertheless of extreme importance for the successful solution of the problem and the correlation of that solution with other aspects of post-war life. It will be necessary to re-examine the general processes of education at the primary, high school, and college levels if we are to provide an adequately trained and broadly educated personnel to enter the field of scientific research in the years ahead. The educational institutions of the country have been challenged by the events of recent years, and in the processes of self-examination the leaders of educational thought have discerned that all was not well with the educational activities of the inter-war era It is recognized that in many respects education is at the cross-roads, and various challenging analyses of our earlier efforts have recently been issued. The new civilization that must emerge from the stress of these times will call for the education of man for freedom, for the formation of free men in free commonwealths To secure this it will be necessary that the immense needs for technological and scientific training shall be balanced by competent education in the liberal arts and humane studies. A balance must, however, be maintained, so that science and research shall continue to attract a steady quota of the competent minds in each succeeding generation of students. Nor should their scientific orientation be unduly delayed by too great a monopoly of their earlier formative years in excessive devotion to non-scientific training. There is a general measure of agreement and a corresponding fund of good will to find a solution of this vital problem of early education in a blend of the essentials of a humanistic education with those elements of a liberal education that can best be aroused by the record of man's attainment, through the years, to his present status in science and the consequences of that achievement on the lives of us all

THE DIRECTION OF RESEARCH

The problem of direction of research is a personnel problem It resolves itself when a competent director is found. If we think over the great centers of research in the physical sciences, whether in fundamental science or applied, do we not finally center our thoughts on the man who symbolized the laboratory? Berzelius, Arrhenius, Svedberg span a century in chemical science in Sweden; from Ostwald to Haber and Nernst runs the story of German research in physical chemistry. We think of the Cavendish laboratory in Cambridge in terms of Clerk Maxwell, Rayleigh, J J Thomson, and Rutherford, of the Royal Institution in terms of Davy, Faraday, Dewar, and Bragg Michelson and Millikan, Richards, Compton, Lawrence, Whitney, Mees; is it not the directors who have made the research center by their own eminence in research or their own faculty of appraising the talents of others, organizing them, and giving to them full scope? "I worked with X," is the formula that the young scientist will use to describe his training rather than "I worked at Y," and in so doing he will reveal the qualities of inspiration and leadership that he had the good fortune to enjoy He will have told of the "director" who did not direct, but drew forth from his associate the best that he could give.

There is no problem in discovering a research director when the institute grows from small beginnings around the pioneer in a new field. The speed with which the institute grows, the health of that growth, will largely lie in the capacities for direction which the pioneer himself possesses. There will be those who, in relative isolation, or at best with a few chosen colleagues, will plan their pathway into the unknown. Some researches will demand large groups of co-operating assistants, large units of expensive equipment, which will require a director who, in addition to his own scientific gifts, must needs have the power of appeal to younger colleagues and to supporting foundations or industries.

It is in the choice of a research director to take on the mantle of his predecessor in an organization that has already attained to eminence that the principal problem of research direction arises To step into the vacant directorship is no light undertaking for any new incumbent, nor is his selection an easy responsibility for any governing board The learned societies and the scientific academies must assume a large share in such responsibility It is for them to realize that "the supply of competent candidates," as Dr Buckley, of the Bell Telephone Laboratories, observes, "is lamentably low" He doubts "whether it could be successfully augmented by any systematic educational procedure. The problem is more to find than to develop those who have the necessary qualifications" Dr Mees would apply the pragmatic test to those who are selected

> When an institute director is making a success and producing valuable work, his field of activity should be enlarged and the institute given increased scope When he is doing only moderately well, it is probably unwise to expand his field even though he may blame insufficient support for his inability to produce results Good men will produce results with a minimum of means, but, as soon as they do so, the further means should be supplied.

Nor does he worry too much about the situation that may arise if the staff and even the director should be appointed for other reasons than their competence "This difficulty will supply its own remedy The institute will simply fail, and the advance of science, locally checked, will proceed elsewhere "

It seems reasonably certain that the selection of research directors and research professors will in the long run be most successful if the body responsible for selection consist primarily of scientific men. Breadth of interest within that body of scientists may help to promote wisdom of choice. The important chairs of science in Sweden are filled only after consultation with colleagues abroad. Within one American university at least, the nominations to a research professorship in any one science must be approved by the research committee representative of all the sciences there taught. It is also quite certain that largely nonscientific boards of control with power to formulate scientific programs for both war and peace and with power to prescribe personnel and facilities for those programs, as is true of certain proposals originating in this country from legislative sources, cannot conceivably be productive of the scientific direction and potential that the country needs in either war or peace

THE SUPPORT OF RESEARCH

In the field of industrial research there is no problem of support Technological progress has revealed, in an ever-increasing measure, that research is the price of industrial development, that it can revolutionize the basis of industry, render obsolete the equipment and techniques of today in the new procedures of tomorrow Facing a fight for survival by the competition which originates in the research laboratories, individual organizations and co-operating groups are deciding to insure their own financial stability and future by a large premium of research effort There is abundant evidence that such insurance pays real dividends

Although this is true of applied science, in basic science, from which all future applied science must inevitably stem, the financial problem of support is far from reassuring Fundamental research is rarely directly or immediately profitable, nor can it readily be made self-supporting Its principal assets are long-range in nature, whether from the body of workers which it produces or the new principles which it formulates from which applied science will ultimately derive the richest revenues Faraday, formulating the principles of induction and the laws of electrolysis, is separated from the electrical age and the electrochemical industry by 50 years or more of technical incubation Sabatier, in his humble laboratory in Toulouse, never shared in the wealth which the principles of catalysis that he laid down brought to a diversity of industries, in fat-hardening, synthetic alcohols, and the petroleum industry. The discovery that the uranium atom undergoes fission processes induced by neutrons, while it makes the age of atomic energy attainable, will not secure the institutions in which such discoveries were made from future problems of support

In large measure the support of fundamental scientific research has, in the past, been the proud privilege of private philantrophy Only in recent decades has any measure of support come from industry and government This is especially true in the English-speaking world In Germany, industry has been more closely knit to and has more handsomely supported, hitherto, the prosecution of basic science. In Soviet Russia, the great development of her modern science has been closely tied to the State, in agreement with the prevalent political ideology, both for direction and for support What of the future?

For many reasons the outlook for support from private philanthrophy is not inviting The leveling influence of destructive warfare, the heavy taxation on incomes and inheritance which inevitably accompany such effort, all imply that institutions of fundamental research which have so richly drawn upon private fortunes in the past for their foundation and continuance face a leaner future so far as such sources of income are concerned It will be necessary to take all measures possible to maintain such private donations in support of science at as high a level as can be achieved, since it is certain that support of such a nature is, of all support, the most desirable and the least hedged around with difficulties of administration If the accumulations of wealth in the future, being less, imply a decrease in the size of individual fortunes and a consequent diminution in size of donations to research, ways must be found to increase the number of donations that can be secured. The broadening interest in the potentialities and effects of scientific research should result in a broadening of the bases from which private support might come Research scientists and research directors incur in this respect a definite obligation to the areas in which their work is in progress Civic and state contacts with successful research work should amplify civic and state support if for reasons of local pride alone The obligations of research scientists do not end when they have achieved successfully the scientific objectives which they set themselves That something has been lacking hitherto in scientist-donor contacts is evident from some observations of Dr Buckley:

> It seems to me that those concerned with the support of fundamental research have not taken into adequate account the need for winning recognition and acclaim for the donor Those who conduct researches and publish their results are commonly very much concerned with their own recognition and very desirous of public acclaim. They have been notably deficient in calling public attention to the source of funds with which the work was done. In this regard, it seems to me that not only has real injustice been done, but research workers have failed to win support which they might have won had this matter of recognition for the donor been given proper attention, particularly in the case of private donations. This is a problem not easily solved, and I think there is real need for development of a technique of recognition that treats the donor fairly and that does not result in the promotion of donations in ways which will be unfortunate.

The officers of the American Philosophical Society have frequently noted this type of blind spot in the recipient of research support. The disease should be cured if for no other reason than that fair and encouraging recognition of donors is productive of wider donor activity Giving is contagious.

The support of fundamental research by industries is a problem of great complexity. It has been argued by some that boards of direction of industry have no right to utilize the stockholders' monies in support of scientific research, the bearing of which on the profit-making of the industry is at best arguable and at worst very remote. The legal aspects of such support have been debated on many occasions. The returns to an industrial donor are generally indirect and are normally of benefit to the donor industry and its competitors alike. Industries of great breadth of activity with highly developed industrial research organizations of their own can most easily accommodate themselves to these factors in industrial support of basic research, and seize swiftly for their own advantage the results that accrue from such support. Taking the long-range view and admitting that immediate profits from new discoveries are rare, we must concede that industry does receive benefit from fundamental research in at least two important directions The supply of adequately trained research workers inevitably increases in centers of intense research activity. The new discovery is as luring as gold in the Yukon Territory Further, the broadening of understanding that accompanies each new scientific discovery means for the industrial research laboratory a surer, swifter, and more economical approach to its own objectives. The history of synthetic toluene is instructive in this regard. In both World Wars I and II the need for toluene far exceeded the peacetime production from coal-tar sources As early as 1916, in World War I, the possibility of producing toluene from petroleum source materials was realized. But, expenditures running into millions of dollars did not solve the industrial problem at that time. Two decades of research in the basic aspects and principles of catalysis were needed to indicate in what direction the program, which led to failure in 1914–1918, could surely and swiftly be brought to a simple technical solution. There are many examples which could be cited of the auto-accelerating effects of basic scientific discoveries on the objectives of industrial research Large industries have, already, decided, and will in increasing measure in the future decide, to support fundamental research.

What of the decentralized industries that operate in small, widely distributed units with only a relatively small number capable of maintaining research laboratories for their industrial problems? What measure of support for pure science can they supply? How can they meet the competition from without, to which large industrial research organizations by the breadth of their own research efforts subject the little industry? The answer would seem to lie in a co-operative effort shared in limited amount by each but, in aggregate, large and impressive It would seem to lie in the development of the research institute, whose main objectives should be (1) the prosecution of fundamental studies in the general field of the pertinent subject, its physics, chemistry, biological and engineering aspects, (2) the dissemination of research information covering scientific and economic aspects of the field, and (3) the training in the methods of research of specially selected personnel at the graduate student level for future positions of responsibility within the industry Co-ordinated with an existing educational foundation, such a research institute could produce mutual advantages for both Each would enlarge its own research horizons, each could supplement the others' activities with personnel and facilities The advent of the co-operative research institute in the educational centers of the land can be made of significant importance in the general problem of support for research.

State and Government support of fundamental research is at once the most obvious and at the same time the most hazardous of all the forms of support. By its nature it recognizes that the endowment of research is the concern of all citizens alike and all should share in its burdens and its benefits. Such support tends, at the same time, to enmesh the laboratory with the hurly-burly of competing ideologies or conflicting interests that hamper even the most liberal forms of government and, in the worst cases, tend to destroy that independence of scientific opinion, that autonomy of science, without which it cannot fulfill its proper functions to society We are too near to recent efforts to break the autonomy of scientific effort, to subordinate it to State ideologies and totalitarian control, to be unmindful of its real dangers We must not forget that even democratic legislative bodies have attempted to define $\pi = 3$, in the supposed interests of their growing youth Can we hope, in these democratic forms of government, for that larger measure of political wisdom that is prepared to surrender to competent scientific bodies, such as the National Academy of Sciences, the problem of disposition of community support to scientific sections of the universities and research foundations, freeing it thus from every vestige of political or ideological control? The history of the relations between the United States Government and the National Academy of Sciences in the past does not augur well for future improvement in this regard May we not hope, however, that the lessons of these harsh years, in which scientifically trained university presidents, executive officers of scientific and research foundations, professors of science, have crowded the offices of government departments in striking contrast to the days of peace, may we not hope that those lessons will show that the peace can be lost, has in the past been lost, because of neglect or oversight of the major role that scientific discovery, no less than applied science, plays in those days of peace? May we not hope for the realization that, no less in peace than in war, local, state, national, and international relations, social and political affairs, have become inseparable from the discoveries of the scientist in his laboratory and their manifold applications? And, realizing this, may we not hope for that measure of disinterested financial support which shall best promote that scientific harvest? To secure this with maximum efficiency and least impedance it seems necessary that the scientists shall be masters in their own households

But, masters in their own households, there still lies upon them the paramount necessity of integrating their skills and their findings with the broad stream of life which flows outside the laboratories To go forward to meet the years of difficulty ahead, we shall need the effort of all men of good will, among whom the scientist, by the nature of his calling, must certainly be numbered. The processes of mutual co-operation and assistance among the individual sciences must be multiplied The isolation of one science from another must become progressively less and less, even though the degree of specialization within a science becomes perhaps greater and greater This calls for an increasing breadth of culture and of education among the scientists, an increasing dedication by the noblest minds to the forward march of knowledge, but it calls also for a fuller appreciation of the social consequences of that knowledge, a franker recognition of the other factors contributory to true knowledge, to wisdom "The modern world," says Maritain, "by which I mean that world which is coming to an end before our eyes, has not been a world of harmony between forms of wisdom, but one of conflict between wisdom and the sciences, and," he adds, "it has seen the victory of science over wisdom." Have not we scientists, so to speak, to surrender that victory? We shall not yield our energy, our courage, our diligence in search of truth We shall but renounce the primacy to which a sick world has thrust us; and we shall gain by our renunciation In the free world to which we still dare to look forward, with the soldiers and statesmen, artists, humanists, philosophers, and priests, we must integrate our scientific skills with the social and spiritual aspects of human life and nature That goal attained, we shall not lack either direction or support for the physical sciences

THE DISCOVERY AND INTERPRETATION OF BIOLOGICAL PHENOMENA

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MAN'S curiosity is an assurance that he will seek to attain "a knowledge of the causes and secret motions of things, and the enlarging of the bounds of human empire, to the effecting of all things possible"[1] When Francis Bacon, in the childhood of science, thus defined the objectives of scientific research, there was little obvious need to consider the organization and direction of research. Then, as now, the scientist's primary want was freedom for inquiry, and the means for providing that freedom was relatively simple and direct But even then it was apparent to some that the corporate action of natural philosophers would aid the individual investigator and more effectively secure to society the benefits of his discoveries

As early as 1617 Bacon proposed in his *New Atlantis* a plan whereby such corporate action might be organized and established He portrayed

> a carefully planned and well-endowed college consisting of a company of thirty-six "Fellows" divided into groups, each of which should be charged with a special department of inquiry or research The field of enterprise was to embrace the whole of Nature, and was to be both theoretical and practical, with the view, on the one hand, of unravelling "the causes of things" and, on the other, of obtaining such a knowledge of facts as would lead to new discoveries and inventions One half of the Fellows were to be employed in collecting from foreign countries and abstracting from books and from mechanical arts and liberal sciences all that had been previously discovered or invented The rest of the company, consisting of six groups, were to be variously employed in trying new experiments, tabulating former experiments and results, and endeavouring to draw forth conclusions useful "for man's life and knowledge" and to establish generalizations that might lead to "greater observations, axioms, and aphorisms."[2]

No such organization for the corporate action of groups of research scholars took shape But as the bounds of scientific knowledge have been widened by the experimental method, so vigorously advocated by Bacon, there has been an increasing need of agencies for the co-ordination and assistance of individual effort Now the necessities of war have fostered the organization of research to a degree undreamed of, even by the imaginative Bacon It is desirable that we pause to consider the problems—the dangers and the advantages—involved in this acceleration of an old trend

A more immediate result of Bacon's philosophical labors was the foundation of the Royal Society, and thus in turn of the American Philosophical Society and her sister institutions It is not inappropriate in these days to recall the circumstances of their simple antecedent, as recorded by one who met from time to time with Robert Hooke, Christopher Wren, John Wallis, Robert Boyle, and other disciples of Francis Bacon "The first purpose of these meetings," says he, "was no more than only the satisfaction of breathing a freer air, and of conversing in quiet with one another about the problems on which we were engaged or the experiments we wished to see undertaken, without being engaged in the poisons and madness of that dismal age of wars."[2] At these meetings there was laid the foundation of the Royal Society

From then until now such associations of scientists have had an important influence on the organization and direction of research In their earlier days these societies played a large role in recruiting men for the pursuit of a scientific career, by the interest they aroused through their meetings By personal correspondence at first, and later by formal publications, they have provided for an exchange of information and for the lasting record of investigations and speculations. Through their discussions they have guided the course of research, and by criticism or by the approval implied in the award of honors, they have fostered high standards of accomplishment When, as in our meetings, these discussions have encompassed many fields of learning, they have encouraged a breadth of outlook and have culti-

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[1] Francis Bacon, *New Atlantis*

[2] Record of the Royal Society, 1940.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 4, JANUARY, 1944

vated relations between scientific specialties This has been especially valuable to the biologist who is dependent upon the methodologies of various sciences, and whose knowledge relates to many aspects of intellectual activity The Royal Society and the American Philosophical Society have shown how such groups of scholars can direct the trends of research when they have means for financial aid at their disposal In this respect our mother institution has the advantage of operating under a government willing to intrust the expenditure of large sums to the constituent scientists of the Royal Society for the support of basic research, unrestricted by political considerations

An essential aspect of all these activities is the voluntary character of the association, formed for mutual encouragement and assistance, operated under the full control of the scholars alone.

In the early days, the societies had an important responsibility for the training of scientific investigators, which is an essential element in the direction of research As the universities gradually extended their curricula to include scientific subjects and laboratory instruction, the teaching functions of the learned society became less significant But our concern for scientific discovery imposes upon us a continuing responsibility for scrutinizing the education of those who will carry on our work.

At first the universities did little more than adopt the informal methods previously employed by the societies, and the instruction was direct and personal As the practical values of scientific tools and knowledge have gained popular appreciation, the teaching functions of the scientist have become confused by the variety of his duties In one pattern of education we endeavor to give large numbers of relatively uninterested students a superficial knowledge of natural phenomena, to train technicians to apply scientific methods in the operation of a technological society, to prepare teachers to communicate existing information to another generation, and only incidentally to train those who would adventure beyond the boundaries of present knowledge These are all worthy functions But it is pertinent to inquire whether, in such a huddle of purposes, we give sufficient attention to the few who are driven by the restless desire for "a knowledge of the causes and secret motions of things." I am not one who believes that the creative scholar is indifferent to his early environment and training.

This is not the place to discuss at length the means by which these difficulties may be resolved, but I would suggest that one characteristic of scientific instruction is unfavorable to all types of student We deal too little with the nature of scientific problems, with the methods for their solution, with the ordered concept of natural laws and their significance We are concerned too much with the mere recitation of scientific facts and data. Under the influence of teachers whose research requires them to spend more time gathering data than in the formulation of synthetic generalizations, scientific teaching often has drifted away from some of its more fundamental purposes I am not unaware that the whole structure of natural science rests upon a foundation of accurately ascertained facts, and that they are the raw materials for any type of scientific training But the student comprehends the full significance of these facts only when they are related to the method of their discovery and to the general principles which they establish or confirm Greater emphasis on the generalizations and relationships of science, more attention to the analytical processes and less to the phenomenological descriptions, will make our scientific instruction more coherent and meaningful Such an emphasis on the basic concepts of a science would provide a better preparation for the teacher and the practitioner as well as for the future investigator It should do much to clarify popular misconceptions regarding the relative values of gadgets and of ideas—of bits of information and of an understanding of natural phenomena

This accent on scientific principles is peculiarly important in the training of biological investigators They deal with a vast body of knowledge that can be comprehended only when it is co-ordinated and simplified by the formulation of precise laws and general concepts Taxonomists thus have brought order out of a chaotic mass of observations. Comparative physiology on the other hand is frequently a repetitious study of mechanisms in a variety of animal forms, with little analysis of the significance of similarities and differences.

The biologist must frequently employ the basic physical sciences and ultimately relate his findings to the problems of man and society. It is, accordingly, desirable that he be trained in the fundamentals of those fields of learning as well as in the several subdivisions of his own science. Only then will he be able to comprehend and utilize physics, chemistry, and mathematics for the discovery of biological phenomena, and be competent to give to the interpretation of his discoveries the human significance society may rightly expect Unless the biologist has acquired the capacity for systematizing the principles of these great territories of learning, he will be unable to comprehend them, and will accordingly become a narrow specialist or be lost in superficial generalities.

Research is related to teaching in another important respect The formal organization of research reflects the pattern of teaching departments, because research within the universities is usually done by those who are primarily charged with instruction. Begun at a time when the scope of the several divisions of natural philosophy was less limited, the departmentalization of science became more restrictive with the growth of the "elective system." In turn the boundaries of these departments have often defined the scope of the instructor's research and have insensibly created artificial barriers to the free range of inquiry Need for a synthesis of scientific effort is expressed in a reversal of the educational trend Thus the beginning course in science at a leading preparatory school is devoted to the study of combustion approached simultaneously through physics and chemistry and biology. At the collegiate level the "Chicago plan" and the system of "honors instruction" minimize the importance of departments and integrate the teaching of specialists from various fields into a co-ordinated system of instruction. On the "roving professor" there is imposed no limit to the scope of his teaching or research Such trends are certain to raise questions about the barriers we have erected around disciplines and departments.

If the development of a more co-ordinated pattern of instruction breaks down the departmental barriers isolating teachers, will it be necessary still to separate the scientist who studies the mechanism of the heartbeat in a lobster from the one who studies the same mechanism in dogs or man, and to call the first a zoologist and the latter a physiologist? And should we separate into the compartments of zoology, physiology, and psychology those who investigate the response of amoebae, of cats, and of men to environmental stimuli, despite the fact they all deal with the same basic processes? Or, since functional mechanisms are studied by measuring changes in fundamental structure, what is the difference between physiology and experimental anatomy?

It may be desirable to retain certain of these compartments for the purpose of administrative convenience, but there is need for clear thinking about the impediments they offer to effective research and the limitations they impose on the character of the training we give our future investigators The individual who is competent to move surely across boundaries is certainly more powerful, intellectually and experimentally, in his attack upon the unknown

There are, however, limits to the powers of any one individual, and it is the primary function of research organizations to extend those limitations Even the lone explorer for new forms of life returns to the organized museum to place his discoveries in their proper relationships And the solitary worker in theoretical biology derives his data from other investigators who employ the resources of modern laboratories For most biologists a more intimate affiliation with an organized group of investigators is necessary for effective research There is a catalysis of thought that results from the daily contacts with others engaged on different problems The assistance of those with the specialized talents, necessary in these days of rapidly multiplying physical and chemical techniques, is more readily available within an organization And on the material side there is access to equipment and large colonies of animals seldom available except through the pooled resources of a group

In all these respects organized groups of investigators benefit by the inclusion of those from other departments of science Within the province of biology mutual effort is made natural by the common interest of all investigators in the nature of biological systems and their relation to the environment Closer working relationships between so-called zoologists and physiologists, between biochemists and bacteriologists, or between ecologists and biophysicists, are but a few of the desirable partnerships in research.

No less advantageous are organized means for introducing the disciplines and methods of the physical sciences into biological research Institutes of physics and chemistry are devoted to the exploration of their own special fields, and rarely will the abler members of those institutes be inclined to co-operate extensively in programs of biological research. Neither will the physicists and the chemists comprehend the nature of biological problems, nor the biologists be aware of the physical and chemical resources available to them The solution is to bring physicists and chemists, physical chemists and engineers, and experts in electronics, together with biologists of varied interests, into powerful organizations for biological exploration The cross-fertilization of methods and viewpoints will engender new ideas and clarify old problems. New tools will become more readily available and will be used with less danger of error under expert supervision. The familiarity of each worker with the general principles and problems of the others' fields will insure the comprehension necessary for the success of corporate action They may be institutes of biophysics or of biochemistry Or better, let them be institutes of biology where scientists may work, free from the limitations of boundaries and fortified by the assistance of others. To thus supplement the powers and resources of the individual investigator is the first function of a research organization

A modern scholar is beset by distractions and demands that deflect him from research A second function of those responsible for the organization and direction of research is to protect the scientist against these adverse influences, three of which readily come to mind

University faculties include many scholars unconcerned with the increase of knowledge. Their activities not infrequently create an unfavorable environment for the investigator. By the multiplication of administrative complexities and by the creation of innumerable committees they absorb their own extensive leisure, and rob the precious time of their more creative colleagues Teaching, too, may break the continuity of effort Few will doubt the benefits that come from the natural union of discovery and interpretation, but each activity suffers from continued interruption by the other Here again sympathetic understanding of the needs of the investigator will provide protection against routine, when freedom is most needed. And, finally, it is not unknown for the patient investigator within a university, or without, to be pressed for evidence of quick accomplishment. Through wise organization the scholar can be given the unhurried, uninterrupted periods necessary for effective research

To many of us organized research connotes large institutions, numerous workers, elaborate administration The concept is derived from the examples in industry and in government bureaus. Smaller, simpler, organizations more often provide the congenial intellectual environment required by the scientist and give better protection against unfavorable distractions Large institutions have the further disadvantage of draining scientific talent into relatively few centers. Less fortunate universities and wide geographical areas are thus denied the abstract and practical benefits a creative scholar gives to his immediate community The healthy growth of our civilization requires a widespread familiarity with the scientific method and an intimate application of research to the life and thoughts of the people This will not be possible within the wide boundaries of our country, if the accidents of history or of financial fortune are permitted to concentrate institutions for scientific research in a few restricted regions.

Few biologists will deny the advantages of organizations for the furtherance of research. There is less general agreement that it is desirable to organize groups of scientists for co-ordinated and directed research on a specific problem. The objection is not so much to the co-ordination as to the direction A biologist, unaccustomed to the large-scale undertakings of applied technology and closely supervised agricultural projects, is unprepared to sacrifice the freedom to direct the course of his intellectual adventures. He rightly assumes that an organization which requires many to work under the direction of a few, no matter how able the few may be, destroys precious values in scientific research.

A large measure of freedom and individual initiative can be preserved, if the co-ordination be wisely directed by selecting for the team those whose interests and aptitudes have already led them toward the problem which is to be investigated They can then be left to explore, as they will, their own sector, aided and guided by the related findings of others in the group, encouraged by the assurance that their discoveries will quickly become part of a greater accomplishment than they could attain unaided. It is thus possible to direct research for a desired end, without losing those intimate satisfactions which come to the investigator who follows his curiosity until he acquires understanding. Such frontal attacks on a problem by closely integrated teams of investigators will seldom yield epochal discoveries in quite new and unexplored fields. Their usefulness is limited to certain types of problems, and they will not stimulate workers of all temperaments to their best effort. But when obvious and urgent human problems can be solved by research, society may justly expect scientists to direct their concerted efforts to a quick solution.

The achievements of the Office of Scientific

Research and Development have demonstrated that scientists can thus work together in co-ordinated effort to accomplish a great common purpose, while preserving the normal methods and motives of research. The conception and organization and direction of this pioneer undertaking are among the major scientific accomplishments of the war.

It has been a disappointment to many biologists that they have not been able to take a more active part in this great effort. But there have been few obvious ways in which biologists as a group, excepting psychologists, could make immediate and vital contributions to the winning of the war Yet this is a technological war, and the function of technology in war, as in peace, is to extend the range of man's normal biological powers and create a favorable environment for the human machine The biologist is therefore an essential, if not an obvious, partner of the technologist. Recognizing this, the Army Air Forces have commissioned more than one hundred biologists to give advice on the design of aviation equipment and to instruct air crews in the physiological consequences of new weapons and in their more effective use

This is but one instance of a growing realization throughout the military services that only when the machine is properly related to the characteristics of the human organism does it adequately fulfill its purpose And how can engineers wisely design the new world in which we are to live, if they are not informed of our biological characteristics and requirements? The direction of more research into the human aspects of biology will fit us better to fulfill a human need now emphasized by war.

That biologists have not been more active in these directions is partly due to the nature of our relations to the applied sciences of agriculture and medicine Thus, physiology and biochemistry and bacteriology, which deal so immediately with human problems, have been fostered more by medicine than by the biological sciences. This delegation of major responsibility for research in a basic science to the professional schools has several undesirable consequences. A physician is largely concerned with the prevention and treatment of disease, and the schools of medicine rightly place a primary emphasis on the applications of the fundamental sciences, rather than on the exploration of their remote frontiers. When the investigator is also a teacher of future physicians, a medical degree is frequently preferred to a training that would better fit the investigator for future research It is, accordingly, no accident that in England the most significant advances in the physiological sciences have been made at Cambridge and Oxford, where the clinical influence has been slight, and in America, at those medical schools which are closely knit into the structure of a university.

The creation of university institutes for the study of both the fundamental and the applied aspects of subjects such as physiology, biochemistry and biophysics, of anatomy and bacteriology and entomology, is conducive to more rapid progress in these fields For although these sciences contribute immediately to the practical accomplishments of medicine and agriculture, they have their roots in the basic biological sciences Their continued growth depends upon research directed by the spirit of free inquiry, unrestricted by the necessity to solve immediate practical problems Through the closer association of pure and applied biology the applied sciences gain direct access to the fundamental discoveries which are necessary for their achievement of immediate ends, the basic sciences are stimulated by the prompt application of their discoveries to the improvement of human welfare

Adequate financial support requires a clearer recognition of these relationships between fundamental and applied research in the biological sciences The material rewards of research are generally appreciated, but few realize that the ultimate origin of practical discoveries is in basic research which is frequently not directed to a specific objective Most people see only the last step in the application of research to a human need The long years of observation, the leap of the imagination, the exacting task of translating the vision into proven knowledge, are unperceived by them. There is too little understanding of the practical necessity of "impractical" investigations, of the sequence of research and the evolution of scientific knowledge.

The support of biological research is especially precarious Chemistry is prized as the source of new wealth, and physics as the creator of magic devices which make man more powerful, or give him pleasure and comfort. But fundamental biology is seldom recognized as the source from which agriculture and medicine derive their power to feed men and make them healthy The situation is made more difficult by the growing tendency to separate from the basic biological sciences those fields which have obvious human significance, and by the creation of government and commercial laboratories for practical research The magnitude of the financial resources for such work is incomparably greater than for basic research which does not have obvious practical advantages A comparison of the degree of support given to these two types of investigation reveals the relative importance placed by society on the satisfaction of immediate needs, as against the discovery of knowledge necessary for the future improvement of human welfare.

The enrichment of man's life by the liberation of his mind from ignorance and superstition is a benefit from research that is even less appreciated This is because there are few who give thought to the circumstances of life and the nature of their environment It is, indeed, assumed by many that only the few are capable of benefiting from the intellectual satisfactions of a liberal education, and the majority are deflected into vocational studies. I doubt the assumption It is more probable that inadequate interpretation of science and philosophy in our educational system, and in the popular press, has failed to reveal to the masses the intellectual satisfactions of pure science. As a result of this indifference, the furtherance of research that does not bear early fruits of practical value has depended on the support of a few enlightened philanthropists and academic administrators, and upon teachers who make research their avocation.

In these days of rapidly changing economic conditions it is especially important that there be a very general understanding of the social significance of research If its motives and methods and values are as clearly appreciated by all classes of people as by scholars, we need have little fear that scientific exploration will be neglected in a democratic state But this will only come to pass if the scientist will assume responsibility for interpreting his work to the public, so that its meaning, as well as its material benefits, may enrich the life of the people The support of research is not philanthropy but an essential element of modern civilization This is more generally understood as scientists relate their discoveries, both pure and applied, to the intellectual and physical life of society.

As research thus achieves a better recognized position in the social structure, financial support for all phases of its activities will become more certain, and scientists will gain the positions of leadership necessary to insure wise organization and direction What is most important, the ablest minds of the country will more frequently be recruited for the discovery of natural knowledge

A CRITIQUE OF MEDICAL RESEARCH

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Rockefeller Foundation

(Read November 19, 1943, in Symposium on the Organization, Direction, and Support of Research)

In accepting the pleasant but nonetheless arduous task of speaking on the subject of Medical Research, I have felt somewhat in awe not only of this audience but of the variety of possible approaches to the subject and therefore the niceness of the choice to be made under the circumstances governing this occasion Whether the treatment of the subject of Medical Research should be in the direction of a historical review, a forecast, a blueprint, an analysis, a description, an orientation or elaborate definition, an indictment or bill of complaints, a eulogy, an apology, a defense—these at least have been some of the possibilities under consideration Yet one more form suggested itself, and I venture to assume that it is the best for present purposes—a critique of Medical Research at present

One can write to a subject but one speaks to an audience In choosing to present a critique of Medical Research, I was influenced by the realization that your several and variant relations to Medical Research may include those of participant, collaborator, reflective witness, supporter, director, or historian To such listeners, descriptions and maplike expositions of the subject would offer but a picayune adventure with no more gained than fathering a few undisputed platitudes Some brief definitions, however, present themselves—more as points of cheerful departure than of lugubrious destination

In using the term Medical Research I include all research undertaken with the intent to extend our knowledge of the nature of health and disease in living tissue, and with special reference to human beings. If you wish to know the actual range of medical research, a full list of research activities in say the year 1938 in ten of our larger medical schools would show so wide a range of subjects as to leave you bemused at the task of defining medical research Nor is medical research by any means limited to medical schools, graduate work in the other university faculties belongs to the category of medical research Meteorological studies upon the nature of cyclonic storms cannot qualify as medical research, though a study of suicides or cardiac failures as related to or influenced by weather conditions could properly be considered an outreaching branch of medical research Nosogeography—the study of the geographical distribution of disease, the nature of inhibition in pigs, or the relation of *gambiae* mosquito to arthropods carried from Africa to Brazil by aeroplanes—the range can be wide The study of tobacco mosaic has more than illumined our knowledge of animal diseases due to viruses Though I am therefore loath to set the ambit of the term Medical Research, there can be no gainsaying the fact that by common usage and implication medical research as a term connotes a potential if not an actual application to human health and human disease The gamut covered by medical research may best be comprehended if we realize that the psychology, the biology, the physics and chemistry of today become tomorrow's physiology and pathology and may well become the therapy or the preventive or clinical medicine of day after tomorrow And, almost as often, the clinical problem of today may formulate the physiological investigation of tomorrow and pose imperious inquiries to the chemist the day after that.

Possibly the word critique is a somewhat ambitious term for the comments I shall offer, yet these comments do involve comparisons with accepted standards (the characteristic of a critique) even though they are not marshalled in support of any one thesis, whether critical or explanatory.

Because there are inherent advantages in emphasizing the distinction between strategy and tactics, I had intended to group what I have to say around those poles strategy as the art of deciding when and on what you will engage your strength, and tactics as the skill, economy, promptitude, and grace with which you utilize your strength to attain the ends chosen by strategy Just as there can be strategy in conversation—the choice of the subject, for example—or strategy in the matter of vacation—summer, autumn, or winter, boating, fishing, or mountain climbing—there can be, and, more important, there always is, deliberately or inadvertently, a strategical ele-

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ment in medical research. Just as most activities can be viewed in terms of the dexterity, the smoothness, the elegance, the rapidity, the promptness, the economy with which they are graced, so medical research is open to appraisal in terms of its tactics

I first set out to prepare a paper on the tactics as well as the strategy of medical research, but soon found that scheme too ambitious, too extensive to be covered by anything better than an index of chapter headings such chapter headings as organization, relation to teaching, recruitment, tenure and retirement policies, the implications of support for research from the state, from industry, from foundations, from private donors, the role of money prizes, of honors and citations, publication problems both in technical journals and the lay press—you can readily see that so many subjects cluster about the tactics of research as to preclude their being included with any remarks on strategy So today I shall not discuss the tactics, the procedures, the practices and methods of medical research, but rather direct your attention to the values and the purposes to be served in medical research, what is worth doing, when and on what we may well engage our strength—in sum, the strategy

Most of us would agree that wisdom is rarer than cleverness, and on reflection it would, I think, be evident that the strategy of research, if not more valuable, is at least more rarely a subject of discussion than the tactics. Strategy is more demanding than tactics since strategy often must reckon with the desirability of doing nothing, or nothing at present, such intentional inactivity is often difficult since inhibition or postponement exhausts nervous energy Furthermore, strategy, involving the knowledge of what may, and what may not, be worth doing, calls for the exercise of a sense of values, usually a more subjective and always a more mature or slowly developed sense than those accomplishments appropriate for tactical success

Therefore, perhaps the first strategic question for medical research is this · Compared with other ways in which the time and strength of man could be spent—for example, research in government, in economics, in mathematics, or aesthetic development through poetry, music, painting, or the other arts—does medical research offer a more valuable return? The answer is not quite so obviously affirmative if we ponder on this passage from Hans Zinsser Writing, of course, of himself, he says:

> He became, however, a profound admirer of Whitehead, who, it seemed to him, combined—in the wide horizon of his mature wisdom—deep erudition of the sciences with sensitiveness to aesthetic values, appearing in this regard to possess some of the qualities, less creative but perhaps more contemporaneously sound, of a Goethe It was in Whitehead's diagnosis of the sick world that R S recognized his own, less learnedly arrived at, to the effect that, with the rapid development of industrialism and urbanization (both consequences of the scientific control of natural forces) there was a neglect of the "aesthetic qualities of the new material environment", there was a limitation of the "moral outlook" at a time when it was most needed The "moral pace of progress," says Whitehead, "requires a greater force of direction," but a grooved professionalism (also a consequence of the headlong rush of science) has brought it about that "the leading intellects lack balance" and "the task of coordination is left to those who lack either the force or the character to succeed in some definite career" The corrective, therefore, it seemed to R S, should be not in the checking of science, but rather in catching up with it.
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> Thus, with Whitehead's assistance, R.S thought he understood the general diagnosis But that is as far as he got before he died He stood before the problem as he often stood at the bedside of a dangerously sick patient, helplessly hoping for greater physicians to point a way of cure. He looked to art, literature, and criticism as the instruments through which this might come For it seemed to him that what had happened was that mankind had been so busy planting the potatoes and corn and turnips of life that it had forgotten to tend the gardens And now it had no gardens in the enjoyment of which it could find the reasons for which it had planted the potatoes and the turnips For the arts and the spiritual values which they represent (and this was the pathology of the disease) had come to be regarded as trivial and not worthy of the efforts of serious men, a speculative commodity like stocks or postage stamps for rich collectors or a plaything for amateurs and eccentric incompetents, at best, a civilized amusement or a hobby [1]

In my mentioning any challenge to medical research, you may be reminded of the advertisement in a Viennese newspaper which ran "Wanted: two hours' argument from an elderly gentleman opposed to matrimony, by a young man resolved to marry." I do not pose the primary question as to the essential worth of medical research just as a bit of target practice The reason for asking ourselves whether medical research deserves all the time and strength it demands is simple but cogent: if we recount *why* medical research is worth while, many of the secondary questions of what *kind* of medical research we should do, will be brought into far clearer definition and perhaps into correct subordination to the larger issues.

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[1] Hans Zinsser *As I Remember Him* 422-423. Boston, 1940.

Let us then state why medical research is worth while.

Now the first and foremost reason for employing our strength on medical research is that to do so maintains and sustains a rational in place of a superstitious view of being alive—a rational interpretation of Life in its myriad forms and functions. By medical research we not merely learn important new facts, we learn a method of thinking about what is already known. By means of research we can reformulate the known, as well as master the unknown by a process of modest but relentless attrition. This rational interpretation of Nature—a heritage from the Greeks—could, I think, be shown to be infinitely precious in the chief study of mankind, which is man. Human conduct has never been continuously rational, and yet, when by research we finally may master all the mainsprings of behavior, we shall have a rational interpretation of human conduct even when it is irrational—in place of the passionate confusion of today.

The second reason for thinking Medical Research worth the strength that may be poured into it, is intuitive and unanswerable: it is a property of life to defend and protect its being. Now that we can investigate disease and so control it, we shall do so in self-defense. The threat of disaster stirs our primitive emotions. By so much as a disease strikes early, it releases the protective sentiments of parents toward their children. By so much as a disease leaves the patient's character intact while moving slowly and unswervingly to death, Medical Research upon such disease will never lack the sympathy, the interest, the hope, and the support of those who have the double privilege of thinking and giving. Perhaps it is more than a coincidence that diseases causing changes in character, and diseases terminating in swift and unexpected death, have been the last to receive support for their study. Almost always, changes in the character of a patient affect his friends and family—their sympathies are profoundly disturbed and horror and aversion outstrip pity. In diseases where death is never seen plucking at the sleeve but is swift, unheralded, and masterful, hope, and so reflection, have not time to dispute the issue.

The third reason why medical research should receive the investment of time and strength is that the medical sciences have a right to share with other sciences the glorious freedom of curiosity implicit in the words "Pure Science." If you feel an almost sensuous pleasure in the discovery of order and natural law, you will not have to fall back on the reassurances that "curiosity pays" or such phrases as "the usefulness of useless knowledge," etc. To be informed that Pure Science Pays, always reminds me of the early missionaries to Hawaii of whom it was said that "they went out to do good and they did very well." So precious and exhilarating an elixir of intellectual life as curiosity, I prefer to take straight, undiluted, without bush or adulterant.

Because medical research tends to place the study of man on rational grounds, because it offers free range to intellectual curiosity, and because its concern with the protection of life is an axiomatic and inescapable extension of the instinct of self-preservation, we may settle the first strategic question by affirming that medical research, when compared with other types of human inquiry, solicitude, and activity, at least deserves all the attention it has thus far received, favorable as this has been of recent years.

With no further hesitation or reluctance as to value of medical research we may turn now to the more tangible and debatable questions—when and on what research may we wisely engage our strength?

Now the first comment on the actual strategy of medical research is that it is becoming too rare an experience. This experience in selecting research projects, in estimating their possibilities and appraising their performance, has tended to become the function of persons outside the ranks of actual investigators. It is a privilege which of late has fallen to the officers of the Foundations, instead of remaining the responsibility of the investigators or the administrators of our universities. The treasurer's report for 1942 in a well-known western university showed a total of $847,000 in contributions for current purposes, of which less than $47,000 was reported as unearmarked money. With less than 5 percent of the research funds on which to exercise their powers of discrimination and selection, the faculty no less than the administrative officers may be expected to lose first their liberty, then their responsibility, and finally their ability to exercise judgment as to what research is worth doing. It is my personal conviction that the Foundations have set an example and established a fashion of giving earmarked funds, which has been followed by a large number of private donors, and which possesses among obvious attractions some serious eventual disadvantages for the recipient institutions Principal among the disadvantages are the emphasis placed upon showmanship and expert mendicancy, the atrophy through disuse of the critical faculty, the loss of responsibility for local problems and of pride in tackling them independently, and finally a restlessness that is second cousin to the restlessness caused by absentee ownership So forceful a group of accusations would deserve more than the word "disadvantages" if they were all to be found always in full-blown development They are never complete, but partial and varying in intensity For it must be remembered that many a gift for research is a direct answer to a request for funds which was born free and untrammelled in the mind of an investigator Nonetheless, strategical experience, that is, experience in selecting research problems and projects, is on the whole too infrequent in our medical schools, and the impact of war research contracts can naturally do nothing to offset the diminishing exercise of free choice

The one device explicitly designed to correct the predominance of earmarked-financing of research deserves attention It is the so-called fluid research fund—a pool or account from which, under exclusively local guidance, sums are withdrawn for the support of selected research projects I do not believe, however, that deciding how money is to be spent is research strategy Deciding what is worth doing is strategy, having money at hand encourages the business of securing such experience in strategy We are foolish not to distinguish money spending from research strategy And I need hardly add that unless the discrimination and the fearlessness of the Fluid Research Fund Committee are of a singularly high order, the results in work wasted and feelings bruised will not speak for the continuation of Fluid Research Funds

Though comments upon the experience in estimating and appraising research work could easily occupy the rest of my time, I shall take leave of it in repeating that almost certainly there is too little of such experience among the medical scientists of today They nearly all need or could profit from practice in managing a fund deliberately made free and unearmarked year after year, since that might force them to examine and decide what is worth doing. No more generally useful gift than a Fluid Research Fund could be made to a medical school resolved to provide the intelligence and protect the integrity required by a fully responsible committee.

"When and on what shall we engage our strength?" runs the strategist's question. Merely to consider the question "when?" reveals the difference between two kinds of research which, like two arrows held in the hand, overlap for most of their length though they point in opposite directions We may postpone research until there are some "good leads," some promising hunches, some encouraging suggestions that we are not far removed from a find Or, lacking any leads or promising indications but in most urgent need of finding something somehow, we may not wait but push research forward in desperation To the question "When shall we engage our strength in research?" one type of response waits for favorable conditions, the other cries out "Now!—We must!" Needless to say, the one form is common in peace, the other in war I have often heard that the methods of wartime research should be applied in peace, as well as laments that the criteria of peacetime research are foregone or forgotten in war Obviously the point of departure, the motivation, and the results of the two types of research are radically different When war demands a specific problem be tackled, the focussing of every sort of applicable ideas and experience is called for In peacetimes research is not so hard pressed and tends to weigh more carefully the state of current knowledge and the leads it provides, the quality of the researcher and the assistance provided him in colleagues, consultants, assistants, and equipment The conditions of war and peace are radically different and so are the motives of research workers, but the contrast ought to be instructive. If war research in medicine can teach peacetime research anything, it probably is this if A and B are working on problems complementary or otherwise closely related, it is a particularly wise expenditure of research funds to pay the expense of visiting each other. This is constantly done in war and all too rarely done in peacetimes Also it seems obvious that wartime research will demonstrate the remarkable effectiveness of co-ordinated research programs, as well for medicine as for other subjects In the rather remarkable speed with which some programs have been executed we forget that freedom from teaching has released energies otherwise exhausted in peacetime And we forget that wartime research operates on very large financial resources and that patriotic self-sacrifice oils many a bearing that would heat up with the friction of peacetime competitiveness and jealousy.

Before naming some areas of present ignorance (and as, I hope, future knowledge), which will probably receive the strategist's attention, I would like to insist that the primary and almost sacred right of choosing a subject to be studied, of framing a hypothesis to be tested, of planning and performing some crucial experiment, belongs not to the donor or the administrator, but to the investigator himself. If this privilege is not explicitly declared to be that of the investigator, the suspicion will soon sporulate that medical research should be directed from a strategical G. H. Q.—a concept so remote from my convictions and so repugnant to my tastes as to call for repudiation at once.

Indeed, I have had experiences that make me wonder whether young scientists in this country feel quite as free to choose their own problems as I would like to have them feel. For a number of years I used to talk with candidates for advanced fellowships of The Rockefeller Foundation. They came from different countries, and were the result of different systems of education and maturation. To the question "What do you want to do on your fellowship?" the American usually replied in terms of a problem certainly set and probably selected by his professor. This seemed so much less frequently the case with candidates of other nationalities that I came to expect it as the American answer. Was it a continuation of our national inclination to suffer children gladly, prolong adolescence patiently, and deliberately defer maturity? Or was there nothing national about it? When closer observation showed that fellowship candidates from the Middle West formed a group quite at variance to all the other Americans, the phenomenon became more interesting. The Midwestern candidates usually know what they are interested in themselves: why Midwesterners do not as frequently mirror their professors' interests as the rest of the Americans, I do not know.

If I am right in my impression that American medical research at present is not particularly hospitable to the young investigator who formulates completely fresh hypotheses in fields not familiar to his seniors, then we should find in research literature today a rather large number of instances in which the primary or germinal observation has been made by young investigators not in the United States but in other countries. After ten years abroad and ten years at home, I would be inclined to think that there are countries where more value is attached to independence and originality of thought than in this country. We Americans have been inclined to belittle the brief report in foreign literature that contains an observation and a hypothesis to fit it but lacks complete substantiation or massive proof. Sometimes I think we forget what the last war did to the strength of European laboratories, that they commonly have not been the equal of the German chemical organization. And we forget that it is by just such incomplete but fresh, independent, and pioneer observations that some of our largest, most fashionable, and most heavily laden scientific caravans are led. I beg you not to take offense at an observation in some ways favorable to others than holders of American passports. In the generation before mine a number of influential American medical leaders knew and understood European medical science through study periods there. Today, I do not suppose there are four deans of American medical schools who have studied as much as two years anywhere outside of the United States. Lack of travel or foreign residence at an impressionable age makes for parochial horizons and I think we may as well admit that we now have the elements of a continental parochialism—rendered the greater by a nationalism of an intensity rarely if ever equalled.

But if I could presume upon your patience, another criticism would be far more worth advancing than the complaint that youngsters in American medicine practice something of the chameleon's art. The extraordinary feature of medical research in America in our times is the frequency with which demonstrated ability in research is rewarded by being extinguished. We praise research, we earnestly seek and prayerfully select young investigators of promise, we use productive scholarship and research ability as the cardinal considerations for promotion and even for the selection of professors. We speak warmly of the research career, and after all that build-up we contemplate with almost bovine placidity the professor who can't do any more research because he is too busy fulfilling the prevalent idea of a professor. The situation is not merely a diverting paradox or an academic peccadillo. It is a stupid and wateful abuse, committed, like many elusive futilities, in so noble a cause that its correction would seem disloyal.

It would be consoling to think that only in the earlier stages of institutional development is it necessary to sacrifice research to administration, and that once the preliminary planning has been done, men selected and trained to do research will find a tradition and circumstances facilitating their natural tastes and aptitudes But the evidence about us hardly justifies such an evasive hope.

A more common verbal exoneration of the disgrace of obliging men of unusual research ability to devote long hours to teaching and administrative work consists of saying· "Oh, if he didn't like to do administrative work, he wouldn't do it. Besides, if he was really a research man and successful at it, he would let others do the teaching and administration" The fallacy of that particular bit of gratuitous character analysis is that it does not fit the salary and promotion policy observable in all schools (and some institutes), where the assurance of tenure and the reward of salary are attached to teaching and administrative responsibilities, and not to the pursuit of research

Now those of you congenitally disposed to seek for something harder and better than laissez faire will bear with me if I mention by way of remedies or solutions three procedures which in some measure at least keep research men in circumstances favorable to their best productivity

One is the creation apart from the universities of Research Institutes or Centers for Advanced Study Like quinine in the South Pacific, this is a pretty good remedy but there's not enough of it to go around But even if the research institutes became quite numerous, they would still have to connect themselves somehow with universities interested in research, in the effort to be near new blood and adequate recruitment So at long last, the importance of having research men in the universities would be recognized as important after all

Another remedy is to create special status for research men—to call them Research Professors, or Distinguished Service Professors, and give them extra salary or freedom from large teaching loads Though such arrangements may have worked reasonably well in some instances, they run counter to common sense in trying to devise a uniform title for exceptional men, in suggesting that other kinds of professors aren't expected to do research, and in implying that many men can constantly justify so magniloquent a title and so privileged a position Probably, however, the greatest obstacle to the establishment of research professors in distinction to just plain professors is the incomprehension of the public. "Why should a teaching institution have duplicate professors who don't teach?" is the layman's query. I believe that there we touch upon the American tradition of higher education which assumes that universities are not societies of learned men with students in attendance, but large places of instruction whose ultimate unit is not a savant but a "class" almost guaranteed "graduation" at a stipulated time.

Now the presently serious aspect about indifference to what happens to the research man when he becomes a professor is not merely the stupidity or the insincerity or the wastefulness of such procedure, but this: that by so much as institutions and men favor research and learning, they can survive social change without vital losses, but by so much as institutions and men become identified exclusively with indoctrination and teaching, they will be used by political groups In that way lies discredit and possible disaster. The College de France survived the French Revolution without much change· the University of Paris was closed

The third remedy is to maintain as adjuncts or fellows or monitors (any non-descriptive title would serve. the English employ the title "readers") a number of places equivalent to professorships, available to men of research ability but without any conspicuous title or invidious distinction of status. The chief consideration would be to maintain absolute separation, but free passage between this position and professorial status If the reader had not a complete identity of status separate from the professor, he'd soon be no freer than a substitute; if he could never become a professor, you'd have just another dead-end career in universities already quite costive enough

The essential preoccupation of wise administration is to create and to foster the circumstances, the human relationships, in which gifted men will be most productive and prodigal of their gifts There are those who produce best in peace, there are those who produce best under pressure. The scholar serves his interest more wisely than his comfort And my thesis is that we need not have all professors, but some circumstances for the scholar who is not a professor—some easy-fitting title that will encourage rather than constrict Possibly such a change would increase the professor's responsibility for being a competent expositor. In America, hiding themselves in the skirts of Research when someone begins to criticize their incapacities in speaking or writing or otherwise conveying facts and opinions, our professorial brethren contemn the art of exposition, confusing it perhaps with exhibitionism or the like

In wartime, the selection of research projects is determined in large measure by immediate need, often by pressing emergencies In peacetime, the selection should be and usually is decided by the imagination of the investigator, operating with the existent knowledge and techniques of his day and age. With these two factors in mind I would venture to predict a few characteristics to be expected in the medical research in the second half of the twentieth century.

We shall be investigating those factors affecting the optimum performance of the organism, not merely the infections, intoxications, and degenerative changes which reduce or destroy its functions The distinction between sickness and health has tended with the advance of knowledge to become quantitative and gradual rather than a qualitative and abrupt difference. We have already an extensive number of tests to measure degrees of illness. An immense area awaits research upon the measurement or titration of function Current studies of the performance of heart, lungs, and central nervous system at high altitudes illustrate this coming exploration of conditions affecting optimum functioning of organs, organ systems, and organisms.

Such studies upon external factors affecting performance will eventually and certainly direct attention to intrinsic or inherent differences between performers. So striking will be the results of early studies in individuation that a likely impetus will be given to anything explaining or even partially illuminating the remarkable uniqueness of every human being From three quarters, besides the measurement of functions, I would expect light—the conditioned reflex studies, long-span studies of nutrition, and long-continued studies of human inheritance Indeed for the adequate execution of studies in human genetics we need among scientists something of the continuity as well as the abnegation of the religious order, without, I hope, any of the incalculable genetic losses inflicted on the human race by most of the celibate religious orders. Some new organization of researchers must be evolved to carry on those studies of human phenomena which require many years to complete. We have had a foretaste of such studies in the researches on child growth and development. In this field the tendency has been steadily to extend the period under which the individuals are under study. I have mentioned long-span studies of nutrition since it is evident that not merely temporary individual nutritional status deserves attention—which it is beginning to receive—but the effects of nutrition on animal colonies over periods of time adequate to establish the results of diets on genetically known stock in terms of their reproduction and survival Probably other psychological approaches should be added to the conditioned reflexes—in order to reveal the slow and cumulative experiences by which an individual becomes unique Certainly the medical research of the second half of this century will emphasize the function of the nervous system, from the study of the nerve impulse to psychology and psychiatry

Surely any discussion of values in current medical research could well afford mention of subjects seemingly neglected or temporarily ignored but which might probably or desirably receive attention in the future One is torn between the prophecy built upon conviction and the prophecy born of hope Whether a statement belongs in the plain future indicative, the subjunctive, or the optative mood, it is hard to be sure

In any event I should like to name a few fields for research in which the value for human life would seem to justify a great deal of effort. In the first group are subjects almost sure, under any circumstances, to be pursued in the predictable future with increasing vigor. in the second group I place subjects the strategy of whose future I would less willingly see left to chance

The aeroplane and the great expansion of travel in this war and in the future will favor nosogeography—the geography of disease—and its natural corollary, the study of the relation of climate to disease and health Let me add that there is no reason why meteorological medicine cannot enjoy the benefits of being an experimental science, with advantage to animal husbandry as well as to man It would be natural in the light of our discoveries in nutrition and in psychology to emphasize the influence of man's surroundings, for it dawns upon an increasing number of investigators that to comprehend what man is, you must be prepared to study what he takes in from his environment and what are his external relations as well as his internal arrangements This type of consideration will give an ecological flavor to many a research project—and the environment may be dealt with in a wide variety of terms—sociology, epidemiology, political or industrial organization, or psychological stimuli. In the light of the certainly increasing average span of human life the degenerative and the chronic diseases will receive greatly increased attention. Geriatrics may well establish its entirely logical claims to serious attention.

Among my major hopes let me record the wish that biophysics be soon recognized as the brother of biochemistry, even if the time is now too late to consider it the twin. If the last world war was in a sense fought by the chemists, this war is similarly being won by the physicists Is there any reason for not expecting great things from establishing facilities and careers for biophysicists? One of the natural outgrowths of such a preclinical science might be the now long overdue development of physical therapy in this country. Please do not conclude that I think it time for chemistry to cede place to physics On the contrary, the development of chemotherapy in this country has called for support for the last twenty years. I should think the life insurance companies could try to regard themselves as intelligent businesses rather than tumid trustees laboring in the light of stained glass windows It would be a mark of intelligence for life insurance companies to put up funds for the support of research in chemotherapy comparable to what the food industry is putting up for research in nutrition Think of what sulfanilamide and penicillin will save the life insurance companies in the next five years!

Of course the closest companion of first-rate chemotherapeutic research is pharmacological research I would hope for measures leading to a substantial recruitment of first-rate talent in pharmacology and a far wider application of pharmacological methods to the resolution of problems throughout medicine

The time is ripening for the application of genetics to the study of human disease and normal human physiology. As a natural concomitant of increasing knowledge of human heredity, I believe we shall see a growth in the so-called "constitutional medicine" and that facts so obtained will illumine not only disease but the innate functional capacities characteristic of different persons.

Possibly Medical Research will, in the next decade or two, hold up its method of thought to critical review and analysis I find the level of interpretation of data so painfully low that, for example, I should like to hear no one attribute a condition to any cause without being obliged to specify whether he meant the cause to be understood as the predisposing, the precipitating, or the perpetuating cause If, as Francis Peabody insisted, a scientist is known by his mental processes, I believe that explicit and detailed research on the mental processes appropriate in medicine would bring great returns to research if only in the discipline it would establish

In closing, let me offer the following summary:

In offering this critique of the present status of medical research in the United States, emphasis was placed upon the ends, the objectives, and the values of medical research. Space would not permit a full account of the conditions, the procedures, methods and means of its administration, prosecution, and support, and these tactical considerations were omitted

The main claims upon our efforts, our resources, and our attention, which medical research presents, are these it sustains a rational interpretation of life, it is an inescapable extension of the instinct of self-preservation, and it gives to man a particularly interesting field for the exercise of intellectual curiosity

The strategy of medical research, that is, the deciding of when and on what to use our investigative energies, is an exercise with which the professors in our schools have all too little experience The creation of Fluid Research Funds would increase their familiarity with the art of deciding what research is worth doing

This inexperience may be traced to the earlier years of training when many a young American feels more the impact of his teacher's interests than the full responsibilities of his own curiosity

But chief among the characteristics of American research to which I have drawn attention is the remarkable way in which ability in research is neutralized, sterilized, or otherwise wasted by the existing demands of administration and teaching. The creation of readerships or posts of equal pay and tenure to professorships, but without the traditions or connotation thereof, is urgently needed.

To these comments I have added some surmises as to the probable directions and characteristics of medical research in the next few decades. Nosogeography, the effect of differences of environment on genetically similar organisms, genetics, biophysics, and chemotherapy seem probable and promising fields for medical research in the future.

DISCUSSION[1] ON THE SYMPOSIUM "ORGANIZATION, DIRECTION, AND SUPPORT OF RESEARCH"

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(*Read November 19, 1943*)

"ORGANIZATION and direction of research"—how repellent these words would have been to many of the creative minds of the past, and may still be to a few of those of the present! The famous scientists of a hundred years and more ago were mostly solitary workers, organizing no research except their own and directing nobody but themselves. This seems entirely natural, for research is by its very definition the unplannable activity *par excellence*. Yet most scientists of today belong to institutions organized under directors, and there is little to suggest that they are either less successful or less happy than their isolated forerunners. Therefore, strange as it might have seemed to a Newton or a Faraday (and we do not know that it would have seemed strange to them), there is no present reason for spending time in marshalling proofs that organization and direction can be good. The question is not how to justify organization and direction, but how to contrive them to the best advantage, never forgetting that there will always be some men of value who will do best without either.

Mr. Taylor's answer to this question is impeccable but incomplete. To get good direction we must have a good director. So we must indeed, but how shall we recognize him? Luckily the graduate student seems to have a flair for recognizing him, else there would not be so many examples of an academic scientist pouring forth from his laboratory such a flood of new knowledge as no one man could discover in ten lifetimes. But this partial answer pertains only to the simpler part of the question, leaving unanswered the other part. How choose the director for a group which is composed not of docile beginners, but of mature and independent men? This task also is somewhat simplified by the fact that many mature and competent men are by preference followers rather than leaders. If an institute contains more than one of the leader type, the demands on the tact and what Mr. Taylor calls "the selfless wisdom" of the director must be great.

Mr. Bronk speaking for the biological sciences, would like the director to be versed in them all and the physical sciences also. He would like, I presume, to hire the future Aristotle, and so should we all, but there is reason to fear that the world has already seen the first and the last of the Aristotles. This should not, however, deter us from trying to train a man to roughly equal proficiency in (let me say) *two* sciences, even at the cost of apparently leaving him less proficient in both than he might have been in either by itself; the advantage might be great, the cost might even prove to be only apparent.

In listening to Mr. Gregg's address, I derived the impressions that medical research is largely research in *applied* science, and indeed research of such obvious importance that it little needs the *apologia* which the speaker skilfully gave for it, that its financial means are much greater, and that its future enterprises are much more clearly marked out for it, than is the case with the sciences called "basic" or "pure." Nevertheless his phrase "fluid research funds" implies that there is need that the available funds be transferable from one enterprise to another, and this again brings up the delicate questions of organization and direction of a vast science, which have to be solved without the prospect of a future Aristotle becoming available to solve them.

Underlying all others is the practical question: Where is the money to come from? The scientists of other centuries lived on private means, on the income of sinecures, or on gifts. All three methods are known today, though the word "sinecure" has acquired so unpleasant a connotation that one hesitates to use it even for a professorship of which the incumbent is technically paid for delivering one or two lectures a week. Actually the dictionary tells us that the original meaning of "sinecure" is not a position free of care for the

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[1] Written without benefit of the manuscripts of the speeches, although abstracts of two were available and notes were taken during the presentations.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 4, JANUARY, 1944

incumbent, but "an ecclesiastical benefice without cure of souls"; and a research professorship, being a benefice without cure of students, could blamelessly bear the name. However the name may be regarded, two of the speakers have told us that professorships of today are not sufficiently sinecures Newer methods of financing research are support by private industry and support by government French science has been supported almost entirely by the State, and its merits and defects should be carefully examined. Support by private industry is superbly exemplified in this country Support by private industry, by endowments, by gifts, and by the leisure conferred by independent means are all of them contingent on the present social system—call it the free-enterprise system, call it the capitalist system, call it what you will Opposition to this system is loudly expressed by many, sometimes even from endowed institutions I think it behooves the rest of us to be more vocal in defense of the system which has made it possible for such entities as the Rockefeller Institute, the Carnegie Institution, the University of Chicago, and the American Philosophical Society to be born, to flourish, and to achieve their aims in freedom

POLITICAL ECONOMY IN THE MODERN STATE

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(Read November 20, 1943, in Symposium on the Organisation, Direction, and Support of Research)

Lord Acton [1] has outlined the historical background of modern freedom essential to the social sciences The lesson of Athenian experience taught that "government by the whole people, being the government of the most numerous and powerful class is an evil of the same nature as unmixed monarchy and requires for nearly the same reasons institutions that shall protect it against arbitrary revolutions of opinion "[1] In Rome "the vice of the classic state was that it was both church and state in one Morality was undistinguished from religion, and politics from morals and in religion morality and politics there was only one legislator and one authority "[2] "The ancient writers saw very clearly that each principle of government standing alone is carried to excesses and provokes a reaction Monarchy hardens into despotism, aristocracy contracts into oligarchy, democracy expands into the supremacy of numbers."[3] While the necessity of checks as essential to liberty was thus recognized, classical civilization never achieved "representative government, the emancipation of the slaves, and liberty of conscience "[4] These achievements became possible with the rigid discipline under the Hebraic scriptures and the contribution of Christianity

> When Christ said "Render unto Caesar the things that are Caesar's, and unto God the things that are God's" those words gave to the civil power, under the protection of conscience, a sacredness it had never enjoyed, and bounds it had never acknowledged, and they were the repudiation of absolutism and the inauguration of freedom For our Lord not only delivered the precept but created the force to execute it To maintain the necessary immunity in one supreme sphere, to reduce all political authority within defined limits ceased to be an aspiration of patient reasoners and was made the perpetual charge and care of the most energetic institution and the most universal association in the world. The new law, the new spirit, the new authority gave to liberty a meaning and a value it had not possessed in the philosophy or in the constitution of Greece or Rome before the knowledge of the Truth that makes us free [5]

The state was circumscribed in its authority by a force external to its own

The downfall of the Roman empire was followed by the rise of the Roman church Hobbes wrote "If a man consider the original of this great ecclesiastical dominion he will easily perceive that the papacy is none other than the ghost of the deceased Roman empire sitting crowned upon the grave thereof."[6] In the words of Locke, Christianity made "the one invisible true God known to the world, and that with such evidence and energy, that polytheism and idolatry have nowhere been able to withstand it "[7] Its centralizing tendencies were followed after the invention of printing by the protests of Martin Luther, reinforced by the opposition of political states. He was compelled to take up the position that authority was more dependent on divine revelation and less on ecclesiasticism His position and the translation and printing of the Bible opened the way, on the one hand, to the growth of the Calvinistic

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[1] First Baron Acton, *The History of Freedom and Other Essays* (London, 1922) · 13 *Cf* Shailer Mathews, *The Spiritual Interpretation of History* (Cambridge, 1916) The latter shows no appreciation of the necessity of securing a balance between centralized organizations as a means to freedom.

[2] Acton, *op cit* 17. Sir James Mackintosh described the burning of Hindu widows as a horror generated by "union of law, of morals, and of religion. When they unite they are omnipotent. The course of nature may be stopped and we may recoil from our most exquisite enjoyments. When these forces oppose each other, their power is proportionately diminished." (*Memoirs of the Life of the Right Honourable Sir James Mackintosh* (London, 1936) 1 155) "So far in history, freedom to think, to observe, to judge men and things severely and dispassionately, has been possible—always be it understood, for a few individuals,—only in those societies in which members of different religious and political currents have been struggling for dominion" (Pendleton Herring, *The Politics of Democracy* (New York, 1940) · 429)

[3] Acton, *op. cit.*, 19–20.

[4] *Ibid.*, 25–26.

[5] *Ibid.*, 29

[6] Leslie Stephen, *Hobbes* (London, 1928) 230.

[7] Thomas Fowler, *Locke* (London, 1883) 158.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 4, JANUARY, 1944

state, as in Switzerland and in Scotland, and on the other, to the growth of Puritanism as it flourished among the sects in Holland and in England "The substitution of the Book for the Church was the essence of Protestant revolt" (Morley) Calvin evaded the dangers of the Reformation in ecclesiasticism under Luther by enforcing two cardinal laws of human society, self-control as the foundation of virtue, self-sacrifice as the condition of the common weal, and created a new centre of union for Puritanism[8] The first English Baptist Church published a declaration of faith in 1611 which stated that "no church ought to challenge any prerogative over any other" and that "the magistrate is not to meddle with religion or matters of conscience nor compel men to this or that form of religion," statements constituting "the first known expression of absolute liberty of conscience"[9]

The divorce of Henry VIII brought the emergence of ecclesiastical power in England as distinct from Rome and the concentration of power under the Tudors in the Crown, Parliament, and the Anglican Church which came into conflict with Puritanism under the Stuarts The opening of the New World and the expansion of trade across the Atlantic and to the Mediterranean and to India brought vigorous complaints against trading monopolies, the Crown, and the established church Commercialism, Puritanism, and Parliament reinforced each other Richard Baxter wrote "Freeholders and tradesmen are the strength of religion and civility in the Land; and gentleman and beggars and servile tenants are the strength of iniquity"[10] In the late sixteenth and the early seventeenth centuries Parliament began to reflect the influence of Puritanism

The problem[11] of religious and civil liberty reached a crisis toward the middle of the seventeenth century Among the Puritans there emerged the "*dogma of the two orders* Man as man belongs to the order of nature . . . God is the creator and ruler of both orders; but they have different economies and are ruled by different laws."[12] Roger Williams insisted on the one hand "on the natural rights of spiritual men." Separation of the two orders enabled the Puritan to adopt "radical and naturalistic ideas, the sovereignty of the people, and government by consent in the natural field, and to remain dogmatic in the spiritual field. The principle of segregation of the spiritual and the natural, the church and the state, became the basis for the doctrine of toleration on the one hand and the secularization of the state on the other" Moreover, "ideas of liberty, of equality, of democratic organization, of government by the consent of the governed, of truth and agreement reached through free and equal discussion" within the order of grace were carried over to politics and the secular field[13] Harrington wrote. "Where civil liberty is entire, it includes liberty of conscience, where liberty of conscience is entire, it includes civil liberty"[14] Puritanism therefore had its impact on politics in its insistence on agreement through discussion,[15] the separation of church and state, a free state composed of equals paralleling a free church with a democratic form of government In the struggle between Puritanism and Charles I, the issues were sharply drawn and the king lost his head

The Puritan revolution strengthened the position of Parliament, but Charles I was an unconscionable time a-dying His spirit lived on in the restoration under Charles II and nearly a century after the glorious revolution of 1688 was reflected in George III. But the free press of the Netherlands and the writings of Milton and Baxter and of Locke gradually prevailed in limiting the authority of the state and in extending religious liberty. To quote Lord Acton again:

> By arresting the preponderance of France, the Revolution of 1688 struck the first real blow at continental despotism At home it relieved dissent, purified justice, developed the national energies and resources, and ultimately by the Act of Settlement, placed the Crown in the gift of the people.[16]

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[8] *Essays by the Late Mark Pattison*, collected and arranged by Henry Nettleship (Oxford, 1889), 2, ch. xii.

[9] N H. Marshall, "Baptists," *Encyc. Brit.*, ed. 14.

[10] "Puritanism," *Encyc Social Sciences.*

[11] A. S P. Woodhouse, *Puritanism and Liberty* (London, 1938).

[12] A. S P. Woodhouse, "Puritanism and Democracy," *Canadian Jour Economics and Polit. Sci.* 4 (1): 9 ff., 1938.

[13] *Ibid.*: 11. "The fact to recognise is the tremendous force of the doctrine of Christian liberty itself, and its fundamental position in the struggle for religious toleration."

[14] *Ibid.*: 13. Rainborough's statement expresses the fullest implications· "The poorest he that is in England has a life to live, as the greatest he" (*ibid* · 19)

[15] On the significance of discussion, see Walter Bagehot, *Physics and Politics* (*The Works of Walter Bagehot* (Hartford, 1889) 4· 569)—especially the answer to critics of discussion such as Carlyle. For a contrast with France, see J U. Nef, *Industry and Government in France and England, 1540-1640* (Philadelphia, 1940).

[16] Acton, *op. cit.*: 54-55.

Encroachments on civil liberty under George III led to the outbursts of Junius and Wilkes in the interests of a free press, and with the success of the American Revolution[17] shifted the responsibility of Parliament to the people rather than to the Crown Parliament in its earlier struggle with the Crown overreached itself and, becoming adaptable to control by George III, contributed to the break-up of the Empire

In New England the Puritan element developed a theocracy comparable to that of Switzerland and Scotland "Theocrats of all kinds must be persecutors" (Leslie Stephen) Its harshness led to the expulsion of Roger Williams and to the settlement of Rhode Island The struggle between Crown and Parliament in England accentuated the separatist tendencies of the intensely commercialistic Colonies of New England[18] The insistence of Crown and Parliament on supremacy in the reign of George III brought a variety of protests in England and in the Colonies Lord Camden stated that "taxation and representation are inseparably united God hath joined them No British parliament can separate them" Otis in the Colonies followed Coke and influenced Adams in arguing that "in many cases the Common law will control acts of parliament and adjudge them to be utterly void, for where an act of parliament is against common right and reason or repugnant or impossible to perform, the common law will control it"[19] The common law occupied an important place in the speculations which preceded the Revolution. Coke, with his reverence for the common law, supported Parliament against Charles I and was used to support the Colonies against Parliament The Assembly of Massachusetts expressed a willingness of compromise by recognizing the Crown but not Parliament It stated on March 2, 1773 "Our ancestors received the lands, by grant from the king; and at the same time compacted with him, and promised him homage and allegiance; not in his public or politic, but natural capacity only" Feudalism and the Crown were based on land and territorial rights Parliament emerged with the influence of primogeniture and the importance of maritime trade Settlement on the North American continent brought conflict with the authority of Crown and Parliament

The revolt of the Colonies against the centralizing tendencies of Crown and Parliament brought them face to face with the problem of framing an acceptable central organization in the Constitution The influence of Milton and Locke, though weakened in England under Walpole and later George III, was reflected in the work[20] of Frederick the Great and Voltaire and carried forward in the philosophy of Jefferson It favored decentralization Hamilton and the federalists favored centralization The Declaration of Independence stood in sharp contrast to the Constitution The compromise of balances[21] in the Crown, Courts, Lords, and Commons in Great Britain emphasized by Blackstone and Montesquieu provided the pattern for checks between sources of power in the President, Congress, and the Supreme Court, and the necessity for appeal to the people

The position of learning in the struggle for civil and religious liberty was precarious "Greatly as the Calvanistic churches have served the cause of political liberty they have contributed nothing to the progress of knowledge"[22]

> Banished from the roman empire in the sixth century, or earlier, the classical conception of beauty of form re-entered the circle of ideas again in the fifteenth century after nearly a thousand years of oblivion and abeyance Cicero and Vergil, Livius and Ovid, had been there all along, but the idea of composite harmony, on which their works were constructed, was wanting The restored conception, as if to recoup itself for its long suppression, took entire possession of the mind of educated Europe

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[17] John Viscount Morley, *Burke* (London, 1921), ch. iv

[18] See W P M Kennedy, *Essays in Constitutional Law* (London, 1934) 3-23.

[19] See A. C. McLaughlin, *The Foundation of American Constitutionalism* (New York, 1932) 125-126, also R. G. Green, *Political Ideas of the American Revolution* (Durham, 1932) · 124 ff ; C. H. McIlwain, *The American Revolution· A Constitutional Interpretation* (New York, 1923) : 152 ff., C. H. Van Tyne, *The Causes of the War of Independence* (Boston, 1922) 1, ch. ix

[20] "The conditions of the order which was established after the confusion of the fall of the Roman power before the inroads of the barbarians, and which constituted the Europe of the early and middle ages, are now tolerably well understood, and the historic continuity or identity of that order is typified in two institutions, which by the middle of the eighteenth century had reached very different stages of decay and possessed very different powers of resisting attack. One was the German Empire, and the other was the Holy Catholic Church. Frederick dealt a definite blow to the first, and Voltaire did the same to the second." ' (John Viscount Morley, *Voltaire* (London, 1921) · 134.)

[21] See Goldwin Smith, *Essays in Questions of the Day* (n.p, 1893) 95–97, also James Bryce, *The American Commonwealth* (New York, 1915) 1, chs I-iii, C. A. Beard *Economic Origins of Jeffersonian Democracy* (New York, 1915), V L. Parrington, *The Colonial Mind 1620–1800* (New York, 1927)

[22] *Essays by the Late Mark Pattison* 2, 41

> The first period of the renaissance passed in adoration of the awakened beauty and in efforts to copy and multiply it.
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> But in the fifteenth century, "educated Europe" is but a synonym for Italy. What literature there was outside the Alps was a derivative from, or dependent of, the italian movement. The fact that the movement originated in the latin peninsula, was decisive of the character of the first age of classical learning (1400–1550). It was a revival of latin, as opposed to greek, literature. It is now well understood that the fall of Constantinople, though an influential incident of the movement, ranks for nothing among the causes of the renaissance. What was revived in Italy of the fifteenth century was the taste of the schools of the early empire—of the second and third century. There were, no doubt, differing characteristics, for nothing in history ever exactly repeats itself. But in one decisive feature the literary sentiment of the fifteenth century was a reproduction of that of the empire. It was rhetorical, not scientific. Latin literature as a whole is rhetorical. There are exceptional books, such as the "Natural history" of Plinius, but, on the whole, the idea of science was greek, and is alien to latin. To turn phrases, and polish sentences, was the one aim of the litterateur of the empire. This divorce of the literature of knowledge, and the literature of form, which characterised the epoch of decay under the early empire, characterised equally the epoch of revival in the Italy of the popes. The refinements of literary composition in verse and prose, and a tact of emendation founded on this refined sense, this was the ideal of the scholar of the italian renaissance.
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> The decay and extinction of the artistic enthusiasm of the Italians was gradual, but may be said to have been consummated soon after the middle of the sixteenth century.[23]

> As the eye, captivated at first by charms of person, learns in time to see the graces of the soul that underly and shape them, so the classics, which had attracted by their beauty, gradually revealed to the modern world the rich wisdom which that beauty enshrined. The first scholars of the renaissance enjoyed, without labour, the harmonies of language, the perfection of finish, which the great masters of latin style had known how to give to their work. Just when imitation had degenerated into feebleness, mannerism, and affectation, the discovery was made that these exterior beauties covered a world of valuable knowledge, even in the latin writers. And underlying the latin literature, it was perceived, was one more valuable still, the greek. The interest of the educated world was transferred from the form to the matter of ancient literature. Masses of useful knowledge, natural or political, the social experience of many generations, were found to have lain unnoticed in books which had been all the while in everyone's hands. The knowledge and wisdom thus buried in the greek writers presented a striking contrast to the barren sophistic, which formed the curriculum of the schools.
>
> It became the task of the scholars of the second period of the classical revival to disinter this knowledge. The classics, which had been the object of taste became the object of science.[24]

> The first period of humanism in which the words of the ancient authors had been studied, was thus the preparatory school for the humanism of the second period, in which the matter was the object of attention . . . The *first* period in the history of classical learning may be styled the italian. The *second* period coincides with the french school. If we ask why Italy did not continue to be the centre of the humanist movement, which she had so brilliantly inaugurated, the answer is that the intelligence was crushed by the reviviscence of ecclesiastical ideas. Learning is research, research must be free, and cannot coexist with the claim of the catholic clergy to be superior to enquiry. The french school, it will be observed, is wholly in fact, or in intention, protestant. As soon as it was decided, as it was before 1600, that France was to be a catholic country, and the university of Paris a catholic university, learning was extinguished in France. France, "noverca ingeniorum" saw her unrivalled scholars, expatriate themselves without regret, and without repentance. With Scaliger and Saumaise the seat of learning was transferred from France to Holland. The *third* period of classical learning thus coincides with the dutch school. From 1593, the date of Scaliger's removal to Leyden, the supremacy in the republic of learning was possessed by the Dutch.[25]

With the assassination of Henry IV, Casaubon migrated from France to England.

The struggle in England was disastrous to its universities.

> When twenty years of tranquillity and order had restored the possibility of intellectual life, we find two results. First, that taste, poetry, and literature, were the first intellectual fruit to revive after the moral pestilence which had desolated the nation. The reign of Elizabeth produced accordingly a rich harvest of poetry and general literature, but it was not till the beginning of the next century that speculative thought and the severer studies again raised their heads. Secondly, that the movement of the national mind is carried on no longer within the Universities, but without them. From that time to the present, the Universities have ceased to originate, to rule, even to respond to, or be affected by, such intellectual ac-

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[23] Mark Pattison, *Isaac Casaubon 1559–1614* (London, 1875): 507–508.

[24] *Ibid.*, 509.

[25] *Ibid.*, 510–511.

> tivity as the nation has possessed. The whole of that sphere of thought in which a liberal training consists, or by which it can be accomplished, has been abandoned by them. So far as it has gone on at all, it has gone on without them Ever since Henry VIII's first interference with opinion here, the Universities have been kept in dependence by the States, under Elizabeth, and under James and Charles, the fetters were drawn tighter and tighter, and education, starved by its severance from the living current of thought and opinion, gradually died out [36]
>
> The measures then taken in the cause of order, security, and permanence, had the effect of drying up the very springs of our life, and cut us off from giving or receiving from the nation at large a healthy intellectual impulse. Then was laid the foundation of that fatal divorce between the Universities and the national mind, which has lasted ever since This alienation reached its acme, politically, about the middle of the last century, when Oxford had become indentified with the sullen and anti-national Jacobite faction, morally and intellectually, about the close of the century, when it can scarcely be said that the University gave any education at all We sustained our very existence by means of our political connexion and our landed property, and had altogether lost our hold on the national mind. Speaking only of Oxford, and omitting exceptional instances, such as the prelections of Sanderson on Moral Philosophy in 1643, or those of Blackstone on English Law in 1754, we may say, that from the Laudian Statutes of 1636, till the First Examination Statute of 1801, the University *curriculum* became more and more narrow, the efficiency of what remained, less and less [37]

The results have been described by Adam Smith, Gibbon, and others in the late eighteenth century Sydney Smith[38] wrote, "The only consequences of a university education are the growth of vice and the waste of money."[39] Advances in philosophy came from the Continent and particularly Holland Advances in astronomy and mathematics after Galileo and the discovery of circulation of the blood by Harvey early in the seventeenth century provided the background for the philosophy of Descartes and Spinoza and the writings of Hobbes. Bacon gave an impetus to the study of science particularly by his attack on the dialectics of the school men. Locke toward the end of the century stimulated an interest in psychology, and Newton made notable advances in mathematics and astronomy While England made its contributions. Pattison has written:

> If we take the philosophical and religious literature of England for the earlier half of the eighteenth century, we shall find upon it the stamp of a second-hand and derivative character The writings of the English Deists—Shaftesbury, Chubb, Toland, and Woolston—have that sort of originality which proceeds from ignorance of what has been thought or written The speculative impulse came from the Continent · from two or three leading minds—from Descartes, Spinosa, and Bayle In England it obtained notoriety, publicity, and diffusion [40]

While the vigorous struggle for civil and religious liberties in England was being prosecuted in the late eighteenth and early nineteenth centuries and their position in the United States was being strengthened and consolidated, the principles of economic liberty were being formulated and advanced in Scotland, "the only kingdom in which the Reformation triumphed over the resistance of the state" Union with England in 1707 provided the background for an escape from the intolerance of religious tyranny in the expansion of trade[41] from Glasgow and in the attractions of law[42] and literature in Edinburgh, "that garret of the earth,—that knuckle-end of England —that land of Calvin, oatcakes and sulphur"[43]

The universities of Scotland escaped from the heavy hand of the state, and while the church attempted to excommunicate Hume, it was possible for him and for Hutcheson and Adam Smith to strengthen the extension of civil liberties in the direction of economic freedom Adam Smith presented a systematic extension of principles first in the spiritual and then in the natural field His *Theory of Moral Sentiments,* published in 1759, gave a "system of ethics on the basis of a harmonious order in nature guided by God, and in an incidental manner applies his general doctrine with strict consistency to the economic order"[44]

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[36] *Essays by the Late Mark Pattison* 1 449.

[37] *Ibid.*: 452.

[38] See *The Works of the Rev. Sydney Smith* (London, 1848) 1: 383–393.

[39] G W E. Russell, *Sydney Smith* (London, 1905): 12.

[40] *Essays by the Late Mark Pattison* 2 402–403.

[41] W R. Scott, *Adam Smith as Student and Professor* (Glasgow, 1937)

[42] "Every youth, of every temper and almost every description of character, is sent either to study for the bar, or to a writer's office as an apprentice. Is a lad stupid, the law will sharpen him,—is he too mercurial the law will make him sedate;—has he an estate, he may get a sheriffdom, is he poor, the richest lawyers have emerged from poverty,—is he a Tory, he may become a depute-advocate,—is he a Whig, he may with far better hope expect to become" (*The Journal of Sir Walter Scott* (Edinburgh, 1890). 36.)

[43] G. W. E. Russell, *Sydney Smith* (London, 1905): 28.

[44] Jacob Viner in *Adam Smith 1776–1926* (Chicago, 1928) 119. See also G. R. Morrow, *ibid*, ch. vi.

> Smith's doctrine that economic phenomena were manifestations of an underlying order in nature governed by natural forces, gave to English economics for the first time a definite trend toward logically consistent synthesis of economic relationships, toward "system building" Smith's further doctrine that this underlying natural order required for its most beneficent operation a system of natural liberty, and that in the main public regulation and private monopoly were corruptions of that natural order, at once gave to economics a bond of union with the prevailing philosophy and theology and to economists and statesmen a program of practical reform[35]

While the virtues of self-reliance and self-denial were in the New Testament, they were not fully recognized until they had been made the foundation of political economy in the *Wealth of Nations*[36] Scotland became "the land of porridge and political economy"

Professor Hollander has traced the influence of the master's work in the establishment of the classical school of political economy The lectures of Dugald Stewart, in which the doctrines of the *Wealth of Nations* were expounded, were attended by James Mill, the father of John Stuart Mill, Sydney Smith, John Ramsay McCulloch, and Henry Brougham "The 'gospel of mammon' according to some entered the university curriculum" "The word *corn* sounded strangely in the moral class and *drawbacks* seemed a profanation of Stewart's voice."[37]

The *Edinburgh Review*, which first appeared in October, 1802, gave an important place[38] to economic criticism. Malthus, Say,[39] and Ricardo and later John Stuart Mill came under the influence of the *Wealth of Nations* and devoted their energies to its extension, its simplification, and the widening of its influence Marshall described the period 1770–1820 as the classical epoch in which the author "by the form or the matter of his words or deeds has stated or indicated architectonic ideas in thought or sentiment which are in some degree his own and which once created can never die but are an existing yeast ceaselessly working in the cosmos"[40]

In his attempt to elaborate the natural order as understood by Adam Smith and immediately to combat the notions of Godwin as to the perfectibility of human nature, Malthus wrote his *Essay on Population* and its extensive later revisions His thesis that population tended to outrun the food supply was a profound contribution to the subject of political economy, as a branch of biology, and to the subject of biology Both Wallace and Darwin, who developed the theory of evolution independently, have paid tribute to the crucial position of his work In a letter to Wallace dated April 6, 1839, Darwin wrote "I came to the conclusion that selection was the principle of change from the study of domesticated production, and then reading Malthus (October 1838) I saw at once how to apply the principle."[41] Both Malthus and Darwin were exposed to bitter attacks, but their contributions to the science of biology, including economics, cannot be denied Herbert Spencer elaborated the significance of Darwin's contributions to the social sciences His influence ranged from the academic work of Thorstein Veblen in the United States to the important political achievements of John Morley in Great Britain

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[35] *Ibid* 116–117

[36] Acton, *op cit* 28.

[37] *Adam Smith 1776–1926*: 33 "When an University has been doing useless things for a long time, it appears at first degrading to them to be useful. A set of lectures upon Political Economy would be discouraged in Oxford, possibly despised, probably not permitted. To discuss the Enclosure of Commons, and to dwell upon imports and exports—to come so near to common life, would seem to be undignified and contemptible In the same manner, the Parr or the Bentley of his day would be scandalized to be put on a level with the discoverer of a neutral salt, and yet what other measure is there of dignity in intellectual labour, but usefulness and difficulty? And what ought the term *University* to mean, but a place where every science is taught which is liberal, and at the same time useful to mankind? Nothing would so much tend to bring classical literature within proper bounds as a steady and invariable appeal to these tests in our appreciation of all human knowledge. The puffed-up pedant would collapse into his proper size, and the maker of verses and the rememberer of words would soon assume that station which is the lot of those who go up unbidden to the upper places of the feast." (G W. E. Russell, *Sydney Smith* (London, 1905): 11)

[38] Francis Jeffrey, who became editor, made an abstract of the *Wealth of Nations* in 1792 and in the winter of 1800–01 attended a course of lectures in political economy by Dugald Stewart (Lord Cockburn, *Life of Lord Jeffrey* (Edinburgh, 1852) 1 64) Francis Horner wrongly argued that Turgot's *Reflections on the Formation and Distribution of Wealth* was "a work truly denominated, by Condorcet, the germ of Adam Smith's Inquiry" (*Memoirs and Correspondence of Francis Horner, M P* (London, 1853) 1 p. 68). "The perusal of this beautiful chapter of Smith on the corn trade has suggested to me the propriety of studying his work as a model of argumentative composition I should imagine, that his style of reasoning, so artificial and yet so perspicuous, so ingeniously minute and yet so broad and comprehensive, would be admirably adapted to the subjects of law" (P. 117) Smith's system is "evidently imperfect, and yet it has so much the air of a system, . . that we are apt to adopt erroneous opinions because they figure in the same fabric with approved and important truths" Smith might have "contributed more powerfully to the progress of political science, had he developed his opinions in detached essays." (Pp 126–127) Later he wrote "We owe much at present to the superstitious worship of Smith's name, and we must not impair that feeling, till the victory is more complete. There are few practical errors in the '*Wealth of Nations*,' at least of any great consequence." (P 237) Horner as well as Lauderdale and Dugald Stewart found the fifth chapter extremely difficult if not unintelligible (pp. 164–165, 244–245) Nor did Horner and Lauderdale find Quesnay's Economic Table intelligible (pp. 204–205). Adam Smith's *Moral Sentiments* was "the most scientific and acute description . . in any branch of . . . the natural history of the mind" (pp. 328–329).

[39] *Adam Smith 1776–1926*, ch. vii.

[40] *Ibid.*: 28.

The influence of Adam Smith and the political economists was strengthened by the outcome of the struggle for civil and religious liberty In the last half of the eighteenth century deism declined Newman has remarked that the Roman Catholic church suppresses reason and the Anglican church feeling, and that consequently Anglicans become Methodists and Roman Catholics infidels. The religious influence of Wesley, and the humanitarianism of Wilberforce and the Clapham Sect brought an interest in reform and the end of the slave trade The American and French Revolutions on the one hand tightened the bonds of the aristocracy[42] and on the other accentuated the demands for release, Burke wrote in favor of the American Revolution and against the French Revolution Wordsworth was sympathetic to the French Revolution but turned to hostility Coleridge adapted Kantian philosophy to the demands of the Conservative position. Godwin, Shelley, the Hunts, and Hazlitt sponsored an interest in revolution. The energies of Cobbett and Place and the radicalism of James and John Stuart Mill, Bentham, and writers for the *Westminster Review* stiffened the influence of the Whigs for reform. Sydney Smith and writers in the *Edinburgh Review* and Albany Fonblanque in the *Examiner* were effective in securing Catholic emancipation, the reform acts, the reduction of taxes on knowledge, and eventually the destruction of the mercantilist system.

The effects of the contributions of Puritanism to political liberty evident in the revolt of the American Colonies, and to economic liberty in the publication of the *Wealth of Nations*, have been described at great length They compelled the shift from centralization to decentralization in the British Empire [43] The clearing away of the vast accumulations of mercantilism[44] in the introduction of free trade and in the repeal of the navigation acts, the escape from vested interests centering about staple products under mercantilism, the improvement of the conditions of the working classes in England, the contributions of Bentham and Brougham in the improvement of legal machinery—all of these far-reaching changes were a part of the achievements of the early nineteenth century

The reform movements had their significance for education not only in the attention of the state to popular education[45] and in voluntary organizations such as the Society for the Diffusion of Knowledge, but in the universities The establishment of the University of London brought competition with the old universities, and the intrusion of the state particularly in education in Ireland led to the Anglo-Catholic movement under Newman and the decline of interest in theological controversy

> The railway mania of 1847 and King Hudson was the first material that rushed in to fill up the vaccuum G V Cox says, "Instead of High, Low, and Broad Church, they talked of high embankments, the broad gauge, and low dividends Brunel and Stephenson were in men's mouths instead of Dr Pusey or Mr Golightly, and speculative theology gave way to speculation in railway shares" (Recollections, p 238) The truth is that this movement, which swept the leader of the Tractarians, with most of his followers, out of the place, was an epoch in the history of the university It was a deliverance from the nightmare which had oppressed Oxford for fifteen years. For so long we had been given over to discussions unprofitable in themselves, and which had entirely diverted our thoughts from the true business of the place Probably there was no period of our

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[41] *More letters of Charles Darwin* (London, 1903) 1. 118. See also Geoffrey West, *Charles Darwin* (New Haven, 1938) · 167, and H Ward, *Charles Darwin* (Indianapolis, 1927) : 288.

[42] Anthony Lincoln, *Some Political and Social Ideas of British Dissent 1763–1800* (Cambridge, 1938).

[43] See *The Cambridge History of the British Empire* 2, *The Growth of the New Empire 1783–1870* (Cambridge, 1940), ch. iv.

[44] "That great juggle of the 'English Constitution'—a thing of monopolies, and Church-craft, and sinecures, armorial hocus-pocus, primogeniture, and pageantry" (John Morley, *The Life of Richard Cobden* (London, 1881) 1: 130)

[45] "The schoolmaster is abroad. And I trust more to him, armed with his primer, than I do to the soldier in full military array, for upholding and extending the liberties of his country." (Brougham, in speech, January 29, 1828.)

> history during which, I do not say science and learning, but the ordinary study of the classics was so profitless or at so low an ebb as during the period of the Tractarian controversy. By the secessions of 1845 this was extinguished in a moment, and from that moment dates the regeneration of the University Our thoughts reverted to their proper channel, that of the work we had to do. . . More than this, the abject deference fostered by theological discussion for authority, whether of the Fathers, or the Church, or the Primitive Ages, was incompatible with the free play of intellect which enlarges knowledge, creates science, and makes progress possible In a word, the period of Tractarianism had been a period of obscurantism, which had cut us off from the general movement; an eclipse which had shut out the light of the sun in heaven. Whereas other reactions accomplished themselves by imperceptible degrees, in 1845 the darkness was dissipated, and the light was let in in an instant, as by the opening of the shutters in the chamber of a sick man who has slept till midday Hence the flood of reform, which broke over Oxford in the next few years following 1845, which did not spend itself till it had produced two Government commissions, until we had ourselves enlarged and remodelled all our institutions [46]

Scholarship[47] at last emerged to a foremost place In Cambridge mathematics had checked the growth of obscurantism and provided the environment in which Marshall wrote his *Principles of Economics* In Oxford political economy found a place The historical school was gradually adapted to new demands.

> Indeed, the desuetude and even direct discouragement of the academical study of the Roman law during the last two centuries has been a concurrent cause with the neglect of philosophy, of that contracted habit of the national mind to which this country owes at once its success and its littleness, its success in the practical employments of commerce, its incapacity for enlarged views either of national welfare, or of foreign policy The same superstition of Puritanism, which in the seventeenth century proscribed the speculative theology and philosophy as being popish, operated too against the imperial constitutions, which were tainted by their Roman origin.
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> For the general student in the History School, however, a more valuable scientific element even than the civil code is offered by political economy Indeed, history, unless combined with a study of the positive laws of human welfare, is little better than a portion of elegant literature. It is void of any instructive power, and sinks into an amusement, into curious research, or at best becomes so much information for conversational purposes This subject we may hope to see grow upon this School It should not be treated as a special subject, which, like Roman law, may or may not be known. It should be understood to be *the* theoretical science of history, and should be required of all candidates, except the law students, who have not time for it. Besides the vital connexion of this subject with history, this science is especially the home growth of Britain. It is the only science of which it can be said that the principles have been discovered and extended chiefly by Englishmen, the best books on it are written in the English language, and the very facts themselves on which its inductions are based have been supplied by the mercantile and industrial development of Great Britain. The treatise of Ricardo is almost the perfection of a logically reasoned science applied to an adequate collection of carefully examined phenomena [48]

The economic expansion of England in the nineteenth century gave it a peculiar place

> In one department of progress the English development has indeed been complete, regular, and from within In commerce and manufactures, England may be said to have conducted on behalf of the world, but at her own risks and perils, the one great commercial experiment that has yet been made Our practice has been so extended and diversified, that from it alone, with but little reference to that of the other trading nations of antiquity, or of modern times, the laws of economics have been inferred, and a new science constructed on a solid and indisputable basis.[49]

These far-reaching changes based on economic expansion increased the divergence with the continent.

> "It has often been remarked with regret [writes Sir Henry Maine] that while the learned in the exacter sciences abroad and in England have the most perfect sympathy with each other,—while the physician or the mathematician in London is completely at home in the writings of the physician or the mathematician in Berlin and Paris, there is a sensible, though invisible, barrier, which separates the jurists, the moral

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[46] Mark Pattison, *Memoirs* (London, 1885) · 235–239

[47] "Dorat [died 1588] represents that moment in French literature—a moment which has never recurred—when Greek learning was in alliance with public taste and polite letters. In England this phase of accomplishment, which survived till within the present century, monopolised the name of scholarship. The English word 'scholar' has no equivalent in any living language. In Germany the word 'Gelehrte' is characteristic of a country which has learning without a literature. France, which has a literature pauperised by the absence of knowledge, has no word which can represent 'scholar,' as for nearly three centuries it has not known the class." (*Essays by the Late Mark Pattison* 1 20.)

[48] *Ibid.*: 486.

[49] *Ibid.* 2: 400–401.

> philosophers, the politicians, and the historians of the Continent, from those who follow the same pursuits in England." This divergence—a divergence not of opinion, but in our mode of thinking—is even more manifested in our Theology, than in the moral and political sciences.[50]

Political economy never flourished in competition with law in the universities of France and Germany. The imperial system of Rome was too strongly entrenched Europe began to specialize, and with specialization came the dangers of division.

> In quite modern times it would seem as if the burden and labour of human progress were pretty evenly shared between the three nations of Europe who have any liberty of action at all The French have had hitherto the working out of the political problem To the share of the English has fallen the social and industrial difficulty Speculative Germany has claimed for her own the problems of thought, the abstract matters of Philosophy and Theology To each of these separate tasks is attached its own burden, its own peculiar danger[51]

II

Dangers were accentuated in England by the growth of the press and the importance of public opinion

> These causes are to be found in the general levelling tendency exerted by the advancing tide of civilization. In its superficial aspect, this tendency shows itself in that spectre of the Tory party which they call "democracy" Its deeper forces are found in the increasing influence exercised over Government by a certain dead level of "public opinion" Our national Church has happily escaped political revolution which is leavening society The tyranny of opinion has been making steady advances in Western Europe; nowhere more rapidly than in England At one time it was worth the Church's while to ally itself with the State, i.e. with the Government. But it is now understood that Government has a master, and it is found to be better policy to contract the alliance directly with that master This master is the public opinion of the majority. He who has a good understanding with this can afford to quarrel with power, even though it be the power of a Napoleon. Whatever other merit the opinion of the majority may have, it is, in the present condition of our population, an unenlightened opinion It must be founded on passion rather than on reason; on prejudice, not on knowledge; it will prefer the interests of its class to those of the whole, and its own immediate to its remote interest. The numbers of the wise who think are little capable of increase at any time, but the numbers of the public who are influenced by opinion become yearly greater Knowledge has less and less influence on affairs, and opinion more and more This is not only the case in secular politics, but in religion also Theology has absolutely no weight in this country, where there is not even any faculty of canonists. But religious opinion operates over a larger area than any other opinion whatever.[52]

In an essay on "intellectual responsibility and the political spirit" Morley wrote

> Practically and as a matter of history, a society is seldom at the same time successfully energetic both in temporals and spirituals, seldom prosperous alike in seeking abstract truths and nursing the political spirit There is a decisive preponderance in one direction or the other, and the equal balance between free and active thinking and coherent practical energy in a community seems too hard to sustain[53]

These conclusions were supported by his observations on English life in the latter part of the last century Earlier in the same essay he wrote

> The political spirit has grown to be the strongest element in our national life, the dominant force, extending its influence over all our ways of thinking in matters that have least to do with politics, or even nothing at all to do with them There has thus been engendered among us the real sense of political responsibility In a corresponding degree has been discouraged the sense of intellectual responsibility.[54]

Again:

> The undisputed predominance of the political spirit has a plain tendency to limit the subjects in which the men animated by it can take a real interest. All matters fall out of sight, or at least fall into a secondary place, which do not bear more or less directly *and patently upon the material and structural welfare* of the community In this way the members of the community miss the most bracing, widening and elevated of the whole range of influences that create great characters First, they lose sincere concern about the larger questions which the human mind has raised up for itself, second they lose a fearless desire to reach the true answers to them[55]
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> This impoverishment of aims and depravation of principles by the triumph of the political spirit outside its proper sphere cannot unfortunately be re-

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[50] *Ibid.*: 212.

[51] *Ibid.*: 216-217.

[52] *Ibid.* 298-299. "We are not sure that the amount of illiberality pervading public opinion in England is not more powerful for evil, than the amount of repression exerted over public opinion in France" (*ibid* 402)

[53] *On Compromise* (London, 1921) 61

[54] *Ibid*. 60.

[55] *Ibid.*: 62.

> stricted to any one set of people in the state. It is something in the very atmosphere which no sanitary cordon can limit[56]

On the North American continent opinion has occupied an even stronger position Precisely because of the character of its commercial civilization the Anglo-Saxon community, especially in North America, has linked trade to opinion. Advertising has become an integral part of the activities of the press with vital implications to opinion Political activity and trade are facets of this civilization This background implies a distinct and possibly unbridgeable gap between Anglo-Saxon and other European communities

> In England we have been less affected than other nations by the two main sources of interference, viz the authority of government and the influence of foreigners In Germany we see an unhealthy tripartite division (1) the Governments, (2) the Intellectual Class, (3) the People The governments exclusive, narrow-minded, inquisitorial, meddlesome, the small intellectual class, possessing a compass of knowledge, and a breadth of thought, which make it lead the speculative intellect of the world, the people more superstitious, more really unfit for political power, than the inhabitants of England This divergence of interests between classes is due to the fact, that the Intellectual stimulus of Germany was a stimulus administered from without They received their impulse from their contact with French intellect imported wholesale by the Great Frederick Hence the highest intellects in Germany have so far outstripped the progress of the mass of their fellow-countrymen, that they have absolutely no influence upon them The stock of American knowledge is small, but it is the common property of the whole nation; the stock of German knowledge is immense, but it is in very few hands Thus Germany is unfitted for our purpose by a serious failure in the diffusion of knowledge; American by a deficiency in its amount[57]

In Anglo-Saxon countries the spread of democracy has accompanied the penetration of politics. An American pertinently asked, "Why is it that when Canadians meet they always talk politics?"; but the vice is not peculiar to Canadians. The implications of opinion to institutions of learning in Anglo-Saxon communities have been evident on every hand The tyranny of opinion can be read in the speeches of university presidents and in the degree lists of most universities. A highly respected university in my native country has the distinction of giving the same honorary degree twice to the same premier of a province. The effects of the tyranny of opinion have been evident in the commercialization of universities. One might cite the neglect of an interest in Russia and the Orient and the unseemly haste to repair the damage and the tenuous position of labor in university curricula.

> The University must be the intellectual capital of the country, attracting to itself, not all the talent, but all the speculative intellect It should be an independent body, fenced round by its own privileges—prescriptive rights too sacred to be easily invaded—with its own annals and code of laws But political independence is of less consequence to it than social It should have sufficient social status for its honours and dignities to be in themselves rewards, and that its members should not be under the temptation to secure for themselves other positions, political or ecclesiastical, to which their academical place would then rank as subordinate If there be not some proportion between the prizes which public life, or the professions, and those which the University itself, offer, the former will always draw off the highest talent, and leave only the second-rate and mediocre for academic labours[58]

The significance of political influence has been striking in the social sciences since the depression and the war The demands of parties have compelled a liquidation of the prestige of learning in the social sciences, universities have become reserve pools of labor to supply political parties during periods of crisis. Government as an art has been largely free of academic traditions in democracies, but the crises of the depression and the war have led to a demand on all sides for men bringing prestige. Unfortunately the social sciences have created an impression of scientific finality and the use of the word sciences suggests the power of the fallacy The intensive cultivation of mathematics has enhanced the impression We have definitely emerged from the happy state described in the last century

> This is true of all science, but it is more particularly true of History and Economy. Here, more than in any other field, do we feel that theory exists for the sake of the facts, and not facts for the sake of the theory In these practical sciences we are less liable to that science-worship which infests the more theoretical, in which the more abstract and general the expression the better The economists and statisticians have not yet learnt this fanaticism.[59]

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[56] *Ibid* 71

[57] *Essays by the Late Mark Pattison* 2 398–399.

[58] *Ibid*. 1: 419.

[59] *Ibid*. 2: 424. "The Civil Wars which may be expected, I think, (judging from certain fashions which have come in of late) to spread through many countries

We have learned fanaticism Research, like Mesopotamia, has become a blessed word

The gap between research and teaching has widened perceptibly with the result that the practicability of the conclusions of research have not been constantly exposed to the tests of teaching experience and of their adaptability to communication to students and even more to a democratic community The divorce between research and education has been evident in the establishment of specialized institutes [60] attached or not attached to universities, manned by a staff which does no teaching, part-time teaching where they are attached to universities, or full-time teaching when members of the staff are on leave of absence in such institutes. Specialization has meant the emergence of institutes unconnected or loosely connected with teaching and the creation of organizations which may easily be drawn upon by political parties in times of crises Such organizations may serve as buffers between the universities and political parties, but the advantage is offset by their inefficiency as buffers and by the decline in efficiency of teaching The conclusions presented by specialized institutions become less assimilable to students[61] and more suitable to the demands of bureaucratic exhibitionism The prevailing trend toward education of larger numbers of students and the establishment of institutes have made it impossible for university administrators to adapt themselves to new developments in the field of knowledge

> The necessary tendency of advancing civilization is to divide and subdivide the applications as of labour, so of thought The professions tend to split up into branches, and skill in one becomes more and more incompatible with skill in another The more a subject has been explored, the more time does it take each succeeding student to follow the steps of his predecessors To prevent the disabling effects of this speciality of pursuit, it becomes the more requisite to secure at starting a breadth of cultivation a scientific formation of mind, a concert of the intellectual faculties There is an organization of thought as well as of labour What is wanted is to get this recognized as the proper remedy, and to have it understood that this commanding superiority, this enlargement of mind, this grasp of things as they are, this clear-sightedness, sagacity, philosophical reach of mind is to a great degree communicable by training We, indeed, are far from estimating this power by its applicability Mental enlargement we know to be self-valuable, not useful, but if it can be introduced to notice under colour of being useful in life, so be it, so only that it is introduced The difficulty is to get the thing recognized at all by those who have it not Cleverness, talent, skill, fluency, memory, all these are understood and rated in the market. A cultivated mind, just because it is above all price, is apt to be overlooked altogether [62]

The results have been evident in a rapid deterioration of public opinion A few years ago we had in Canada a premier who occasioned much jeering by a political programme which offered $25 a month to the electors, and I am told that you have had similar phenomena With the aid of the social sciences we have far outstripped this proposal in our offers to provide full employment or, more modestly, reasonable employment. Research has made us perhaps very learned but not necessarily very wise One is always impressed by the contrast between the ripe judgments of men with long experience in business and in poli-

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—together with the malignity of sects which have crept into the place of solid erudition—seem to portend for literature and the sciences a tempest not less fatal, and one against which the Printing office will be no effectual security And no doubt but that fair-weather learning which is nursed by leisure blossoms under reward and praise, which cannot withstand the shock of opinion, and is liable to be abused by tricks and quackery, will sink under such impediments as these. Far otherwise is it with that knowledge whose dignity is maintained by works of utility and power" (R W Church, *Bacon* (London, 1910) 72)

[60] The "present-mindedness" described in the paper by Professor Schuyler (*Proc Am. Philos Soc* 87 (4) 342–351, 1944) has dominated research in the social sciences in the period between the two wars. The interest in the organization of research on a large scale, beginning in the last war, gained momentum in the upswing of business cycle during the twenties and was given elaborate support by governments during the depression. The handicraft was steadily displaced by the machine. As in other industries, large-scale capital equipment brought, if not monopoly, a substantial oligopoly. Research became concentrated with special reference to its own peculiar regard for location theory, of which the details need not be enumerated here. The adaptability of the monetary system with its mathematical bias to the calculating machine has done much to validate the predictions of Veblen in his emphasis on the pecuniary and industrial bifurcation of western civilization. See Thorstein Veblen, "Economic Theory in the Calculable Future" (*Am. Econ. Rev* 15 (1), suppl · 48–55, 1925)

[61] F. W Maitland wrote of Leslie Stephen "He had not the advantage—the inestimable advantage—of constantly endeavoring to explain his theories to beginners and to construct a highway in which fools cannot err" (*The Life and Letters of Leslie Stephen* (London, 1906) 327).

[62] *Essays by the Late Mark Pattison* 1, 460.

ties and the parade of intensive research. Learning is overloaded with preciosities. The importance of the obvious has been overlooked by research The rapid growth of bureaucracies recruited from highly specialized social sciences has brought the rapid growth of ecclesiasticism and the rapid decline of scepticism. Democracies are becoming people who cannot understand, run by people buttressed and protected by the ramparts of research In my country I am told it is customary for members of the bureaucracy to prod members of the opposition in Parliament to follow a line of policy which will compel members of the government to yield to their wishes Well might they accept the words of Locke[63] as their motto: "The greater part cannot learn and therefore they must believe" "Truth" has superseded the search for truth, and little respect is paid to Professor Knight's claim:

> Only on the subject matter of price theory economics can it be said that any great headway toward satisfactory treatment has been made and that is but a limited aspect of the total problem of action Without an adequate ethics and sociology in the broad sense, economics has little to say about policy[64]
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> The direct effects of "preaching" about economic relations and obligations are in general bad, and the kind of legislation which results from the clamour of idealistic preachers—and from the public attitude which such preaching at once expresses and tends to venerate or aggravate—is especially bad All this is the natural consequence of exhortation without knowledge or understanding—of well meaning people attempting to meddle with the workings of extremely complicated and sensitive machinery which they do not understand. . Christianity affords no concrete guidance for social action, beyond an urge to do "good and avoid evil."[65]

The rise of political economy reflected the growth of economic liberty In the attempt to discover a natural order it emphasized the position of the individual Marshall with Jevons, Walras, and Pareto and Pigou extended the principles of equilibrium and widened the possibilities of mathematics. The phrases, "Natura non facit saltum" (Nature never proceeds by leaps), "the one in the many, the many in the one," of Marshall's *Principles of Economics* and *Industry and Trade* reflect the philosophy The combination of the mathematical and the biological fallacies has been challenged by the insistence that civilization is an art. "In art, as in life, the chief problem is a right choice in sacrifices Civilization is the organization of values."[66] Toynbee and students of civilization insist that while "nature never proceeds by leaps," civilization proceeds in precisely that fashion.

Economic liberty followed civil and religious liberty and was less firmly rooted in Western civilization As the most tender plant it has suffered first from the disappearance of civil liberty Economic liberty as supported by the classical school assumed an economy of resources in the policies of government and was effective in the destruction of the wasteful policies of the mercantile systems. It pointed to policies by which large organizations were allowed to grind each other down and to make way for smaller organizations[67] The state intervened as a policeman concerned with more or less fair play[68] between organizations and in the interests of the operation of competition. But the very success of political economy of the classical school evident in the efficiency of industrialism and free trade implied limitations. The advance of Western civilization provided the prosperity which enabled large-scale organizations to extend their activities and compelled the state to restrain them "Vexatious interference . the ordinary treatment of commerce by power" (Pattison) became an obligation. The overpowering demands of administration have been reflected in the decline in emphasis on philosophy in the study of political economy. The curricula of universities are concerned to an increasing extent with the routine and details of administration,[69] and students are taught more and more about less and less Larger numbers of poorer students can be trained in the details of routine, and routine demands larger numbers of poorer students We have all the answers and none of the questions

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[63] Thomas Fowler, *Locke* (London, 1883): 158.

[64] F H. Knight, "Ethics and Economic Reform," *Economica*, n.s., 6 (24): 422, 1939.

[65] *Ibid.* 418-419. "Political Economy, as I venture to think, has been especially valuable in what I have called the negative aspect. It has been more efficient in dispersing sophistries than in constructing permanent theories. . . But the complexity of the problem is so great, —and the working of industrial forces so essentially bound up with other more inscrutable forces, that I confess to a certain scepticism as to the truly scientific character of their more positive conclusions." (Leslie Stephen, *Life of Henry Fawcett* (London, 1886). 449.)

[66] Geoffrey Scott, *The Architecture of Humanism* (London, 1926). 163.

[67] George Unwin's favorite quotation was from William James: "I am against bigness and greatness in all their forms. . . . The bigger the unit you deal with, the hollower, the more brutal, the more mendacious is the life displayed." (*Studies in Economic History* (London, 1927): 463.) See "The Passing of Political Economy" (*Commerce Jour.*, March, 1938), W. M. Daniels, "The Passing of the Old Economist" (*Harvard Business Rev.* 12: 297–303, 1933–34).

[68] See F. H. Knight, *The Ethics of Competition and Other Essays* (New York, 1935).

The increasing power of the state has involved the subordination of political economy in the classical *sense* if not its disappearance Art has been displaced by science. "Not poetry, but science, not sentiment but calculation is now the misguiding influence"[70] The advances in political economy have been concentrated on mathematical analysis and a narrowing of the subject to a small number of experts and a consequent decline in interest in the philosophical and political background. Lip service is paid to the plea that free trade is better than dominion[71] "When goods cease to move across boundaries armies will begin" (Cordell Hull) But since 1914 the modern state has drawn more heavily on the social sciences and thought has been paralyzed The extension of government boards and innumerable royal commissions have in one way or another drawn the social scientist into the service of the state Social scientists in the service of the state necessitate the appointment of social scientists in the service of private enterprise to combat their encroachment. There are few economists who will say, and none who will say so well, as Adam Smith "People of the same trade seldom meet together, even for merriment or diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to raise prices" In these times an economist[72] will be among them If the social scientist is drawn into the civil service, royal commissions, or industry, or even if he is not, he is attracted to the problem of politics and power Within limits an "economist"[73] is something to conjure with and in the hands of the politician he has been used to foster the interests of the party and the state The economist becomes a political economist. He has enlisted with pressure groups in the struggle against other pressure groups or he has enlisted with the state as centralized power The decline in communicability in the social sciences has made the social scientist an ally of the modern state as the great pickpocket. Absorption of the social scientist in bureaucracy in the present crisis has left the community exposed to a flood of arrant nonsense[74]

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[69] One is reminded of the comments on Oxford in the last century. "Young M.A.'s *of talent abound*, but they are all taken up with the conduct of some wheel in the complex machinery of cram, which grinds down all specific tendencies and tastes into one uniform mediocrity The men of middle age seem, after they reach thirty-five or forty, to be struck with an intellectual palsy, and betake themselves no longer to port, but to the frippery work of attending boards and negotiating some phantom of legislation, with all the importance of a cabinet council—*belli simulacra cientes* Then they give each other dinners, where they assemble again with the comfortable assurance that they have earned their evening relaxation by the fatigues of university, and who give the tone to it—a tone as of a lively municipal borough, all the objects of science and learning, for which a university exists, being put out of sight by the consideration of the material *means of endowing them*." (Mark Pattison, *Memoirs* 90)

[70] See Geoffrey Scott, *op. cit* · 92.

[71] "Warriors and despots are generally bad economists, and . . . instinctively carry their ideas of force and violence into the civil policy of their governments. Free trade is a principle which recognizes the paramount advantage of individual action. Military conquerors on the contrary, trust only to the organized efforts of bodies of men directed by their own personal will." (John Morley, *The Life of Richard Cobden:* 460.) "All power is military, but military power requires success to establish it and exercise to preserve it. In such wretched governments therefore peace is a source of anarchy Military government is beyond all others, subject to personal revolutions, because it requires a degree of vigour and vigilance of character to maintain it, to which no passion less powerful than that of ambition, and no education but that of struggle, can discipline the mind." (*Memoirs of the Life of the Right Honourable Sir James Mackintosh* 1: 472.)

[72] The emphasis on large-scale research between the two wars has brought to a sharp focus the problem of status of the social scientist. Without a tradition of professionalism the social scientist has been the prey of governments and of private enterprise The results have been scandalous. It would be invidious to point to illustrations, but it may be worth noting that in the United States the great seductions have been made by private enterprise and in *Canada* by political parties and governments, but exceptions are so obvious that it would be unsafe to make generalizations. Until the social sciences can develop *effective* deodorants and then disinfectants, the subject must continue at a stage comparable to the age before Lister in medicine See Stephen Leacock, *Canada* (Montreal, 1941), David Lewis and Frank Scott, *Make This Your Canada* (Toronto, 1943), Ernest Gruening, *The Public Pays, A Study of Power Propaganda* (New York, 1931).

[73] "It is no explanation of the universal regret, that he was a considerable political economist no real English gentleman, in his secret soul, was ever sorry for the death of a political economist. he is much more likely to be sorry for his life There is an idea that he has something to do with statistics, or, if that be exploded, that he *is* a person who writes upon 'value:' says that rent is—you cannot very well make out what, talks excruciating currency, he may be useful as drying machines are useful; but the *notion of crying about him* is absurd. The economical loss might be great, but it will not explain the mourning for Francis Horner" (Walter Bagehot, *Literary Studies* (London, 1879) 20) This description is no longer accurate.

III

In North America westward expansion after the war of 1812 made enormous demands on the energies of the people The importance of agriculture was evident in the strength of Jeffersonianism, the emergence of Jacksonian democracy, and the abolition of the national bank Penetration to the interior of the continent and increasing distances brought demands for free land and precipitated the clash with the representatives of the cotton kingdom of the South The desert of the southern great plains brought the expansion of cotton-growing to an end and led to the struggle over slave-holding in the territories which ended in Civil War The highly organized aristocratic society based on cotton and slave-owning effectively resisted over a long period the loosely knit democratic society of the North With the eventual success of the North and the collapse of the South, northern policies prevailed Industrialism forged ahead with the production of iron, coal, and oil and the construction of railways It had the support of financial technique worked out by such pioneers as Jay Cooke during the Civil War Lack of resistance was apparent in the domination of the Republican Party and the limitation of Democratic presidents since the Civil War to Cleveland, Wilson, and F D Roosevelt The Democratic Party strengthened its position in the South and in urban centres such as New York The Supreme Court,[75] built upon foundations laid down by Marshall, survived the critical period of the Civil War and strengthened the position of industrialism The increasing strength of the Democratic Party in the South and the urbanization of population eventually brought a demand for new types of control in economic life The diversities of a vast region and a constitutional system with its emphasis on appeals to the voting public and on checks on power have enabled a republic to sustain a civil war and to support adjustments over a long period Absence of a large army, an established church, and a landholding class and the adoption of a constitution emphasizing balance hastened economic development and facilitated strategic control over natural resources by relatively small numbers

In Canada severance of political relations with France after the fall of Quebec enhanced the power of the Church along the lower St Lawrence The American Revolution was followed by the migration of loyalist elements particularly to regions in the Maritimes and in the region which became Upper Canada. Small colonies were organized on a militaristic basis as a means of resisting the United States. Settlement and land policy reflected the centralizing effects of military demands Immigrants from Great Britain especially Scotland and from the United States and French Canadians opposed these centralizing tendencies to the point of rebellion in 1837. William Lyon Mackenzie was thoroughly steeped in Scottish life and tradition.[76] In Nova Scotia the traditions of the New England colonies in the Assembly survived, and responsible government was achieved under the leadership of Joseph Howe without the bloodshed of the St Lawrence.

The dominance of Scottish influence in the Strachans, the Galts, the Macdonalds, and the Mackenzies provided the solution to religious, political, and constitutional problems in the development of government in the interests of capital expansion through canals and railways. The Act of Union and the British North America Act were instruments designed to secure capital funds, and the skill of Macdonald dominated political and religious groups. Confederation provided no basis for the balancing of powers which characterized the constitutions of Great Britain and the United States. The influence of the Senate was nullified by control of the House of Commons and of the Supreme Court by subordination to the Privy Council. The influence of the Crown was steadily reduced by the House of Commons Resistance to centralization in the House of Commons was limited to the brief opposition of the administration of Alexander Mackenzie The complexity of the task of controlling religious groups, evident after the execution of Louis Riel, and conscription, reduced the power of one centralizing group and shifted it to the other But each was concerned with the major task of capital expansion chiefly in the improvement of transportation—railways and canals—the one favoring private enterprise, the other public ownership The dominance of the church, neglect of the army, and absence of an aristocratic landholding class facilitated concentration on control over railways and natural resources Outside the House of Commons, the Privy Council alone served as an effective bulwark in resisting the powers of the federal government and supporting the powers of the provinces Resistance by the provinces was effective through the influence of language, religion, race, and control over natural resources The governmental machinery of the provinces has been strengthened in struggles with the federal government by the gradual extinction of legislative councils Freedom in Canada rests on the tenuous support of the Privy Council and on continued struggle between the provinces and the Dominion The weakening of Parliament with the dictatorship of the Cabinet or of a small group of the Cabinet or of a small group of civil servants who control the small groups of the Cabinet, and the present unanimity of all parties on expansion of state control weaken the prospect of continued freedom The lack of unity which has preserved Canadian unity threatens to disappear The necessity of continuous compromise in the interests of religion, regionalism, and race explains the paucity of political thinking and the importance of pretence in mediocrity to political leaders

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[74] "Of all things, they love a long and an expensive war, and fear peace, for peace produces order, and gives the Prince leisure to enquire into the abuses of the state, it lets him into a right knowledge of persons in the kingdom, and the dregs which float upwards when the liquor is stirred, must sink to the bottom in quiet times, peace restores liberty of speech, whereas in war all is silenced with the single word *necessity*; in peace there is no need to court factions, turbulent spirits are not so useful, thrift may be introduced, and such sudden fortunes cannot be raised out of the public Grievances may be calmly debated, the management of the revenues inspected, the conduct of the ministers may be examined; and good laws may be proposed, without the perpetual objection of, 'Are you for bringing in the French and "Popery"?' But war will better answer their designs, who mean to thrive by the loose administration with which war is generally accompanied, and who propose to prosper by the calamities and misery of their country." (*The Political and Commercial Works of Charles Davenant* (London, 1771) 2 · 311-312)

[75] See Brooks Adams, *The Theory of Social Revolutions* (New York, 1913).

[76] R. A. Mackay, "The Political Ideas of William Lyon Mackenzie," *Canadian Jour. Economics and Polit. Sci.* 3 (1): 1, 1937

Defeat of the Southern States in the Civil War which brought to an end the compromise arrangements, including the Reciprocity Treaty from 1854 to 1866, was followed by railway construction, occupation of free land, and tariffs The United Canadas on the St. Lawrence were compelled to improve and extend the system of canals and railways, and to develop a federal structure. After Confederation the federal government built the Intercolonial from Halifax and St. John to connect with the Grand Trunk Railway and generously supported construction of the Canadian Pacific Railway to the Pacific Coast The government and the railway entered into energetic competition with the railways of the United States for settlers and capital After the turn of the century two additional transcontinental lines were built to the north of the Canadian Pacific Railway. During the World War these railways and the Grand Trunk and the Intercolonial came into the hands of the federal government Centralization in Canada was hastened by the defeat of the Southern States and the necessity of competing with an aggressive and successful North The return in influence of the South in the success of the Democratic Party under President F D Roosevelt facilitated co-operation with Canada.

The phenomenal economic expansion of Great Britain and North America followed political, religious, and economic liberty The century of achievement in the Western world has been traced in Professor Clapham's monumental work on the economic history of Great Britain, France, and Germany, and in Professor Wright's *Economic History of the United States*[77] The enormous increase and redistribution of population, the unprecedented extension of capital equipment and production, the phenomenal rise in the standard of living (expenditure as some would call it), and the prosecution of major wars were a result of increasing efficiency of machine industry, especially through inventions affecting communication and transportation and the utilization of vast natural resources, including two new sources of power, petroleum and hydroelectric power, and the increasing effectiveness of the price system.[78] In the production and distribution of goods the assistance of the state has been enlisted on an extensive scale. In the last sentence of his three volumes, Professor Clapham issues a warning that while

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[77] See also C W Wright, "American Nationalism An Economic Interpretation" (*Facts and Factors in Economic History*, Cambridge, 1932)

"The pressure and activity of business here [New York] can hardly be conceived. Even London does not give an idea of it, for here all are men of business and all seem to have more to do than they *can* do." New York, November 24, 1836 (*Letters of Anna Jameson to Ottilie von Goethe*, ed. G H Needler (New York, 1939) 66)

"In England, (says Thicknesse) one may trust the honour of a respectable tradesman, in France and Flanders I never experienced a single instance of it. On the continent merchants and tradesmen were looked upon in a degrading point of view, merely for being of that class, nor would the most honourable or respectable behaviour ever raise them in the ideas or estimates of the nobles or gentry, who are taught to treat them with neglect, and even contempt Thus being deprived of that great motive to noble and liberal actions, the love of honour, rank, the notice of the great etc. etc., their minds became depressed and degraded." (*Memoirs of the Forty-five First Years of the Life of James Lackington* (London, 1827) 294–295) Primogeniture in England checked the multiplicity of titles which were evident on the continent (Abraham Hayward, *Selected Essays* (London, 1878) 2 253) On the other hand, the celibacy of the Catholic clergy saved Europe from a hereditary priesthood, the evils of Brahmanism, and the abominations of the Asiatic system, and made the Church a channel by which ability in governmental administration could be recruited from the people. (See *Memoirs of the Life of the Right Honourable Sir James Mackintosh* 2: 14.)

> almost the least propertied of their countrymen was already a privileged member of the human race, that the talk of a world of plenty which needed only to be organized, a way of speech then coming into fashion among social experimentalists, was not yet relevant to a world some two-thirds of whose inhabitants had not, by western standards, decent clothing for their backs or plain food enough to eat; and that the privileged position of Britain and indeed of the white races though much less insecure than some pessimists maintained, was not quite certainly a part of the permanent divine order of things.

These achievements were attained with the collapse of mercantilism and the rise of economic liberty. But from the high point at the middle of the last century with the Reciprocity Treaty between Canada and the United States from 1854 to 1866 and the Cobden treaty between England and France, free trade has rapidly receded. Rising tariffs reflected the growth of nationalism, the shift from commercialism to capitalism, and the decline of economic liberty. Professor MacIver has listed the fall of the birthrate, the decline of dogmatic religion, the dominance of finance over industry, the spread of economic consolidations, the growth of urbanization, and the establishment of a mechanical basis for modern society as characteristic of the period.

IV

Wordsworth in a letter dated June 22, 1817, wrote: "There is, in fact, an unconquerable tendency in all power, save that of knowledge, acting by and through knowledge, to injure the mind of him by whom that power is exercised."[79] The supreme and paramount principle of every corporation that has ever existed, whether spiritual or temporal, is to maintain power.[80] Lord Acton summarized the view in his memorable sentence: "All power is corrupt and absolute power is absolutely corrupt." "Power tends to expand indefinitely and will transcend all barriers abroad and at home until met by superior forces." This "produces the rhythmic movement of history." "The passion for power over others can never cease to threaten mankind, and is always sure of finding new and unforeseen allies."[81] "It is by the combined efforts of the weak made under compulsion to resist the reign of force and constant wrong that in the rapid change but slow progress of four hundred years, liberty has been preserved and secured and extended and finally understood."[82]

Power is a machine, but it is one of which the moving force is passion, much oftener than knowledge. This is the agent with whose effects and consequences history has to occupy itself. This is the force which moves the world, small and great, from the intrigue that turns out a minister, to the revolution that changes the face of a continent: passion, creating and animating power, degrading knowledge to be the skilled artificer that forges chains for its subjects. Power, once constituted, has a tendency to perpetuate itself: it is at the discretion of power how much, or how little, intellectual progress its subjects shall be permitted to make. For though knowledge be itself a power, yet as it grows up and finds passion already seated on the throne, it cannot raise its head, except so far as the monarch in possession licenses it. Power, however, though excessively jealous, is not clear-sighted. It has always entertained suspicions of knowledge, and has usually set its face against it, and kept it under. But it has not done so in all countries with the same thorough-going consistency which it has in some, and which it always could show. Hence, in these countries, as in England, the classes in possession of knowledge were able to wrest a considerable share of power from the classes in possession of the landed property, i.e. capitalized power. And as knowledge, the moment it is at all free, has an irresistible tendency to increase, it has, in England, made those encroachments on property, and shows that disposition to encroach more and more on the prerogatives of property, which theorists mistake for a uniform law of progress, and ascribe to the inherent vitality and expansiveness of knowledge. The history of Europe teaches quite another lesson. In it we see written, in characters of blood, the weakness of intellect when separate from force and passion—its utter powerlessness when against them.[83]

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[78] See H. A. Innis, "The Penetrative Powers of the Price System" (*Canadian Jour. Economics and Polit. Sci.* 4 (3), 1938).

[79] Baron Acton, *Lectures on Modern History* (London, 1930), 340.

[80] H. T. Buckle, *Introduction to the History of Civilisation in England* (London, n. d.): 686.

[81] Acton, *op. cit.* 32.

[82] *Ibid.*: 51.

Professor F. H. Knight has written that

> civilized life under mundane conditions simply cannot be pictured without quite extensive power relations between human beings in addition to power over nature. A defensible ethic doubtless condemns over-emphasis on power, but it must include both the right use of power and the quest of power—by right methods—for right uses.[84]

The growth of nationalism and the enormous extension of power in the modern state which has overwhelmed the social sciences have meant that power is regarded as an end rather than a means, and that the checks to centralization of power which strengthened the position of the individual have declined in importance. The effectiveness of the price system and of technological advance which strengthened the position of the individual also provided support through which the state increased its powers. Militarism and the civil service have encroached on liberty. Economic liberty has provided the basis for encroachment on civil liberty.

The problem of power has become more complex with the marked increase in the size of technological units. Physics and chemistry have dominated biology.[85] The state has increased in strength, by fostering and attempting to control the growth of such concentrations of power with their implications to the problems of war and peace. While the state is, as Professor George Unwin has said, a large number of bald-headed men in offices, the civil service has been greatly extended and has become much more inflexible and powerful.

> Great as is my admiration for many of the qualities of our civil service, I am afraid that they are becoming a heavy handicap in our struggle with the totalitarian states, and in making ourselves safe from them. They cramp our energy and spoil or discard our ideas.[86]

In Canada the powers of Parliament have been usurped by the Cabinet and the extension of government by orders in council. Responsible government perished in Newfoundland with scarcely an audible protest. In the United States there is a third term and in Great Britain, national government.

V

In our concern with the problems of modern scholarship we are faced with the prospect of a new Dark Ages. The recovery of France, Germany, and Italy will be necessarily slow. Nor will Great Britain be able to recapture a position achieved in her universities within the last fifty years without enormous efforts. Nor can we see the possibility of an immediate flowering in North America. It has been said that "of all the practical arts that of education seems most cumbersome in its method, and to be productive of the smallest results with the most lavish expenditure of means."[87] What can be done to foster the growth of the tender plant of scholarship? Hume argued that "it is impossible for the arts and sciences to arise, at first, among any people unless that people enjoy the blessing of a free government."[88]

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[83] *Essays by the Late Mark Pattison* 2: 427–428.

[84] "Ethics and Economic Reform," *Economica*, n.s., 6 (24): 421, 1939.

[85] R. E. Parks, "Physics and Society," *Canadian Jour. Economics and Polit. Sci.* 6 (1), 1940.

[86] J. M. Keynes in the *New Statesman and Nation*, Jan. 28, 1939. In Canada efforts have been made to strengthen the civil service by conspicuous notification to members of Parliament that petty patronage will not be tolerated. On the other hand, the sudden incursion of large numbers of individuals to the civil service unfamiliar with parliamentary tradition has led to public discussion by civil servants on an unprecedented scale—further disquieting evidence of the shallow soil of Parliament in Canada. Nor have members of the government protested against these violations of convention. Rather than participate in active discussion themselves, they have apparently preferred presentation of policy by civil servants. Announcements of orders in council with mysterious numbers and continuous shuffling of departments and of the personnel of departments are unhealthy signs of intense activity and inefficiency. Even such public pronouncements as have been made by members of the government in and out of Parliament have smacked of the phraseology of the civil servants. The hand is the hand of the government but the voice is the voice. (See "Notes on Politics since 1918," *Acta Victoriana 1941*, also R. MacG. Dawson, "Our Bashful Bureaucrats," *Winnipeg Free Press*, Dec. 18, 1942.) Extension of government control increases the difficulties of the police and leads to resort to "the system of common informers" described as "clumsy, upon the principle, that what is left to be every man's business will either become nobody's, or be assumed by those who had better attend to their own affairs, and who will manage their own so much worse for meddling with this, and it frequently has proved very troublesome and impertinent in England, where corrupt people have tried to make a profit, and conceited fanatics to glorify God, by the revival of penal prosecutions, which the necessities of commerce or more rational manners have sunk into disuse." (Francis Horner to J. A. Murray, 13th September, 1804, *Memoirs and Correspondence of Francis Horner, M.P.*, 1: 276–277.)

[87] Mark Pattison, *Milton* (London, 1932): 45.

[88] David Hume, *Essays Moral, Political and Literary*, ed. T. H. Green and T. H. Grose (London, 1875), 1: 177.

"From law arises security, from security, curiosity, and from curiosity knowledge."[89] "All these causes render free governments the only proper nursery for the arts and sciences. Nothing is more favourable to the rise of politeness and learning, than a number of neighbouring and independent states connected together by commerce and policy. Limited territories give a stop to both power and authority."[90] "The divisions into small states are favourable to learning, by stopping the progress of authority as well as that of power."[91] "A strong genius succeeds best in republics, a refined taste in monarchies. And consequently the sciences are the more natural growth of the one and the polite arts of the other."[92] "When the arts and sciences come to perfection in any state, from that moment, they naturally or rather necessarily decline and seldom or never revive in that nation where they formerly flourished."[93] "Here then is the chief triumph of art and philosophy. It insensibly refines the temper and it points out to us those dispositions we should endeavour to attain by a constant *bent* of mind, and by repeated *habit*."[94] "The same age which produces great philosophers and politicians, renowned generals and poets, usually abounds with skilful weavers and shipcarpenters." "Industry, knowledge and humanity are linked together by an indissoluble chain and are found from experience as well as from reason to be peculiar to the more polished and what are commonly denominated the more luxurious ages."[95]

We have attempted to indicate the circumstances which have been favorable to the growth of freedom and the spread of learning. The collapse of the political power of the Roman Empire was followed by the rise of the spiritual power of the Roman church. The shift from political power to spiritual power was favorable to the growth of learning, but the organization of spiritual power led to the break of Luther and Calvin, to the reformation and the counter reformation, and to the migration of learning to Holland.

> Enthusiasm being founded on strong spirits, and a presumptuous boldness of character, it naturally begets the most extreme resolutions, especially after it rises to that height as to inspire the deluded fanatic with the opinion of divine illuminations and with a contempt for the common rules of reason, morality and prudence.[96]

> The Church ceased at the Reformation to do that which it had done ever since the first promulgation of Christianity. The education of mankind was from that time forward handed over to the impersonal and irresponsible moralists of the press. That education went on, but outside the Church, under its ban. On the other hand, looking to the temporal and selfish interests of the Church as a corporation, it was the wise choice. It was the wise instinct of the Italian statesmen that led them to choose ignorance and the masses as the solid foundation for the edifice of their ecclesiastical power. An aristocracy of intellect is a very precarious institution. Power always finds its way back to the majority in the long run. The press may be troublesome at times, but the majority can always tie it up when they please to do so.[97]
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> The Church having once committed itself to the fatal principle, that what it once sanctions becomes irrevocable, there is no retreat for it from the accumulating arrears of blunders—errors of policy or principle, to which all long-lived societies, even the best managed, are liable. Consequently the Catholic Church has never been able to re-enter upon the common line of European progress. All the social ameliorations which European states have made for many centuries have been made outside the Church, and in spite of its most strenuous opposition. It has been the consistent foe of every attempt on the part of the wise and good to employ past experience for the correction of legislative error, or for softening the harsh pressure of political institutions. Since the sixteenth century its power has declined, its consistency has never yielded. The consequence is, that the sum total of our intellectual and political gains has accumulated itself outside of the pale, if not of Christianity, yet of the historically legitimate and venerable fabric of the Western Church. The Church's position, with feeble pertinacity anathematizing in the name of religion all the triumphs of human reason and genius, has often provoked the sarcasm of the scorner and the satirist. It is beginning now to awaken other thoughts among us. We are now disposed to mourn over the invincible barrier which the attitude of the Church opposes to that reunion of the intelligence of the West to its religious traditions, which must be regarded as a preliminary condition to the final organization of society on a basis which shall preclude crises and revolutions. Instead of sneering at the impotence of the papal pretensions, we stand in dismay before the impregnable strength of the position in which human Unreason has entrenched itself.
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> The Reformation, so far as it was an intellectual

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[89] *Ibid.* 180.
[90] *Ibid.* 181.
[91] *Ibid.* 182.
[92] *Ibid.* 187.
[93] *Ibid.* 193.
[94] *Ibid.* 221.
[95] *Ibid.* 301–302.
[96] *Ibid.* 149.
[97] *Essays by the Late Mark Pattison* 2: 307.

movement, was an attempt to restore the equilibrium of science and religion, which had been disturbed by the gradual growth of human knowledge [98]

Learning retreated to the fringes of power regions Religious freedom emerged in Holland and economic freedom in Scotland and the American Colonies The achievements of the nineteenth century included the revival of learning in England and the United States, but the end of the century saw the clouds which became the tyranny of opinion Political economy flourished with political, economic, and religious freedom It withered with subordination to mathematical abstractions and science, and became the handmaid of centralized power in the modern state The problem of the social sciences is the problem of the arts in Western civilization

It may be sufficient at present to have pointed to the general fact of the sequence—science, speculation, educational impulse—in the history of civilization, which, indeed, is that of education; for education is only the natural result of the instinct to communicate our culture, an instinct active in proportion as the culture is vigorous and enlarged. An accomplishment, or a skill, its possessor desires to monopolize; talent excites admiration, not sympathy Enlargement of mind, as of character, seeks to propagate itself; the more that share it, the greater our gain. Intellect attracts intellect in proportion to its capacity: there is a freemasonry of intelligence, as such; even while we are young, we are conscious of this before we can comprehend it Turning to history, we may mark two great periods at which this annihilation of mental activity by itself, and the consequent loss of the higher education, has occurred. One such epoch may be found in contrasting the fifth with the middle and close of the fourth century of the Christian era, though in this instance the case is so complicated with other conditions, that we cannot stay to disentangle our point of illustration. The second is more generally known, the silencing of the Latin philosophy by itself, and the consequent decay of University life which had arisen with it, till it was a second time re-invigorated at the classical revival, or the restoration to the world of a new material for thought and observation [99]

We may ask whether we are at the beginning of a third period of intellectual torpor

The place of the social sciences in Western civilization must be seen in relation to the role of universities The university has played its greatest role in serving as a stabilizing factor However inadequately it has played this role in various periods in the history of civilization, it has served as a repository of the reasoning of the ablest minds attracted to it It has preferred reason to emotion, Voltaire to Rousseau, persuasion to power, ballots to bullets Rashdall has described the influence of the University of Paris in checking in France the dangerous tendencies of the Church shown in the Inquisition in Spain It must continue its vital function in checking the dangerous extremes to which all institutions with power are subject The extreme tendencies of modern civilization shown in the rise of the modern state and in the tyranny of opinion compel universities to resist them The trend of the social sciences in response to the demands of the new bureaucracy has been toward increasing specialization And in this it has threatened the influence of universities The university must deny the finality of any of the conclusions of the social sciences It must steadfastly resist the tendency to acclaim any single solution of the world's problems at the risk of failing to play its role as a balancing factor in the growth of civilization The Marxist solution, the Keynesian solution, or any solution, cannot be accepted as final if the universities are to continue and civilization is to survive It is the task of the social sciences in the universities to indicate their limitations in their cultural setting Their contributions to the universities and to Western civilization will depend on their success in that task If they fail, they will add to confusion It is possible that an application of demand and supply curves may assist in determining their limitations, but the character of civilizations suggests that the problem is philosophical and perhaps beyond their power to solve.

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[98] *Ibid* 282–283.

[99] *Ibid.* 1 · 441–443.

WAR AND HISTORIOGRAPHY

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(Read November 20, 1943, in Symposium on the Organization, Direction, and Support of Research)

The fathers of history, Herodotus and Thucydides, were historians of war, and from their days to ours, wars have had immense influence upon historiography The late Dana Carlton Munro, in an address on "War and History" which he delivered as President of the American Historical Association in 1926, expressed the view that the wars which have affected men's historical interests and points of view most notably have been "wars which excited the popular imagination; wars in which men were conscious of common interests; wars which were due to or caused a change in the social polity, wars by which men's interests were broadened or directed into new channels" If this opinion has any validity, it would seem justifiable to expect that the present global conflict, so dominant in its impact on human life, so all-pervasive in its effects on society, so critical for the course of civilization, will exert far-reaching influences in the realm of historiography as in others The time has not yet come, of course, for any secure estimate of these influences, and sundry predictions as to the future of historiography hazarded by eminent historians during and after the First World War do not tempt me to join the ranks of the prophets All that I hope to do is to present a few facts and throw out a few suggestions for your consideration In doing so, I shall have in mind that you are not all historians, and I hope that historians present will suffer me patiently if not gladly, even though too often I seem to them to be laboring the trite and the commonplace.

I

Putting first things first, historically speaking, let us look at some of the effects of the war upon what is necessarily the basis of all history—upon records—keeping always in mind that opinion ought to be tentative and that firmer judgments must await the end of the war and much fuller information than is now at our disposal It will make for clarity if we distinguish between historical records in general and records of the present war, which are now in process of accumulation.

As to historical records in general, the most striking, if not the most important, effects of this war, as of previous wars, have been destructive No accurate quantitative estimate of the loss of records to date through belligerent action can be made The most complete destruction of a body of archives in an air raid that happens to have come to my knowledge is that of the records of the British South Africa Company relating to Southern Rhodesia The company, it seems, had caused a large mass of its archives to be brought from Africa to its London headquarters when it relinquished its authority over Southern Rhodesia to the Crown, in 1922, and in May, 1941, the records were destroyed in a fire resulting from a German air raid[1]

A lurid description of archive-burning in the present war was published in the *World Telegram* of September 11, 1940 In this case the destruction was in anticipation of conquest

> The rumors that reached Paris overnight—chiefly to the effect that the whole front had broken created dismay, and hysteria rose It was visible when, on the morning of May 16, the government gave its first indication of flight Employees of the Quai d'Orsay, the Ministry of Foreign Affairs, took off their coats and began throwing huge bundles of secret documents and archives of all sorts out of the windows.
>
> A huge bonfire was lighted in the courtyard along the Seine and another in the inner court of the Ministry. . . .
>
> So industrious were the employees, so big were the bonfires and so great was the quantity of the material that the fire got beyond control and the Fire Department had to be called, bringing thousands of curious watchers.[2]

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[1] *Am. Archivist* 5: 130, 1942.

[2] Professor Richard B. Morris referred to this incident in a paper read at the annual meeting of the American Historical Association in December, 1940, and published in *Am. Archivist* 4 91–116, 1941.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 4, JANUARY, 1944

There seems to be little doubt that this story is substantially true.[3] During the siege of Warsaw the public archives suffered great losses, and part of the records of the Polish Foreign Office were burned by the Poles.[4]

It is well known that many European libraries have been destroyed in air raids. In England alone, according to a reliable list published in the summer of 1941, twenty-five important libraries had been totally destroyed or very badly damaged. Important manuscript collections and rare books had fortunately been evacuated from many British libraries and other depositories before the bombings began, but it is known that in some cases unique historical materials have been lost. To give just one example: in Coventry, where the central library was completely destroyed, the medieval guild books of the Drapers Company and the Tanners Company perished.[5]

It would be remarkable if valuable records had not been destroyed in the devastations wrought by the Germans in Warsaw, Rotterdam, and other cities. And we know that Nazis have been loose in the diplomatic archives of the countries they have ravished and plundered. Evidence of this is to be found in the "white books" which the German Foreign Office published early in the war in order to make it appear that Britain and France cherished nefarious designs on the countries Germany had over-run and which were duly disseminated in this country by the German Library of Information in New York. Nobody here is so incredibly naive as to suppose that the greatest looters of modern times have scrupulously respected the integrity of government records. It is saddening to speculate on what may have happened in the archives of the foreign offices in Paris, Brussels, The Hague, Oslo, Warsaw, Belgrade, Athens, Rome, and other capitals violated by the Nazis.[6] To say this is not to suggest that they adopted a general policy of destroying public records in the countries which they conquered. On the contrary, it has, generally speaking, been to their interest to preserve and utilize them, for, as Professor Ernst Posner, formerly an archivist at the Privy State Archives in Berlin, has observed, "public records must become the continuous source of information for the regime of occupation if it takes over part or all of the administration of the occupied territory."[7] What will happen when the Nazis are forced to abandon their conquests? Is the savage fury which they exhibited in book-burning in the library of the Royal Society of Naples a foretaste of what is in store for the national archives and great manuscript collections in other cities when they are forced to evacuate them?

On the other hand, the war has greatly stimulated movements for the preservation of records. In England a Records Association was formed in 1932, and within it a Records Preservation Section was established in the following year. The Master of the Rolls is ex-officio president of the association, and Queen Mary is its patron. In the First World War the urgent need for waste paper led to indiscriminate destruction of records in private possession, and at the beginning of the present war a similar demand was foreseen. In a letter published in the London *Times* in September, 1939, the Master of the Rolls announced that the British Records Association, in co-operation with libraries all over the country, was prepared to advise owners of records as to the parts of their collections which ought to be preserved in the interest of history, and the Records Preservation Section has worked actively to this end. The paper salvage drive, nevertheless, seems to have resulted in considerable destruction of private papers, some of which may have had decided historical value.

Protection of public records in the event of war was under consideration in Europe for some time before the war began. The Munich crisis was not lost on European archivists and librarians. The Belgian Archive Service, for example, formulated plans for the protection of records, and a bombproof shelter was constructed in Brussels A large-scale removal of documents from the British Public Record Office was planned and all but begun when news came that the crisis had passed As it turned out, the removal was only postponed Evacuation to repositories which had been secured began soon after the outbreak of the war and continued through the closing months of 1939, and intermittently afterwards. It is gratifying to know that the documents remaining in the Record Office and those that have been removed from it have suffered scarcely at all [3]

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[3] "I had read the same story—probably from the same source—but hadn't troubled to find official confirmation. I asked the question in conference today: many of my colleagues were in Paris at the time. Pierre Lazareff was editor of Paris-Soir. They unanimously affirmed that the story was substantially true: there *was* an auto da fé of diplomatic documents at the Quai d'Orsay." (Professor Albert Guérard to the writer, September 9, 1943.)

[4] Ernst Posner, "Public Records under Military Occupation." The National Archives, 1943.

[5] Friends of the National Libraries, Annual Report, 1940–41. A series of articles by Frank Hickman, entitled "Books in the Battle," describing damage done to British libraries, was published in *The Library World* 43, 1941.

[6] "It is still too early to estimate the extent of the destruction that totalitarian warfare has inflicted upon the archives of Europe, and it is obviously impossible to predict what losses may be expected in the future." (Ernest Posner, "Effects of Changes of Sovereignty on Archives," *Am. Archivist* 5: 141, 1942.)

[7] *Ibid.*

The British Records Association and the Royal Historical Manuscripts Commission, which during the seventy-five years of its existence has reported on many important collections of historical manuscripts in private hands, have exerted themselves for the preservation of historical documents which are not public records, and so far as was known only one private collection had been destroyed by enemy action down to April, 1942

In our own country the danger to records from enemy action has been much less great, of course, than in Europe, but it has not seemed negligible to American archivists and librarians Measures for the protection of the manuscript collections and rare books in the Library of Congress were planned a year before we were at war, and actual removals from the Library to fireproof buildings in localities approved by the War Department took place shortly after Pearl Harbor. The result, in the words of the Librarian of Congress, has been

> to provide, for the irreplaceable and exceptionally valuable materials in the Library's possession, as great a degree of security against damage from aerial attack as can be attained without the construction of bombproof shelters—a measure which has not been practicable under existing conditions [4]

In the spring of 1941 the National Resources Planning Board appointed a Committee on Conservation of Cultural Resources, which, at the request of the President, undertook to prepare plans for the protection of materials of cultural, scientific, or historic importance The presence on the committee of the Librarian of Congress and the Archivist of the United States insured that the subject of the protection of archives and other historical records would not be overlooked In almost all the states, committees on the conservation of cultural resources were established to co-operate with the national committee, and in some states defense councils have given attention to the preservation of records

An obvious means of safeguarding irreplaceable historical materials is to copy them and place the copies in safer depositories Microphotography has made it possible to reproduce documents quickly, in large quantities, and in small bulk The most comprehensive project of this nature has been the result of American foresight and initiative This "gigantic salvaging enterprise, unparalleled in history," as it has been called, grew out of a Conference on Microcopying Materials for Research in Foreign Depositories, held in Washington in June, 1940, under the sponsorship of the Library of Congress and the American Council of Learned Societies Believing that the center of learning would shift from war-torn Europe to the United States, the conference agreed that a plan ought to be formulated for microfilming important unpublished historical sources from all parts of the world, and, more immediately, materials threatened with destruction by the war When work was begun, early in 1941, the international situation was such that the program was confined to Great Britain, and the enterprise came to be known as the War Emergency Program for Microcopying Research Materials in Britain The Rockefeller Foundation made a preliminary grant of $30,000 to the American Council of Learned Societies, the films to be deposited in the Library of Congress, and the grant was later increased by $100,000 The project has been administered by a committee of the American Council of Learned Societies, and want-lists obtained from American historians in various fields were referred to a subcommittee of which Dr Herbert A. Kellar was chairman By the end of 1941 lists of manuscript collections to be filmed, totalling some 25,000,000 pages and including only original and irreplaceable materials, had been sent to England In them appeared such extensive items as the unpublished Pipe Rolls from the early thirteenth century to the early fifteenth and more than two thousand volumes of Colonial Office Papers (in the Public Record Office) and the Newcastle and Hardwicke Papers, aggregating some 1450 volumes (in the British Museum) [5]

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[3] *Trans. Royal Hist. Soc*, ser. 4, 25 21, 1943

[5] Accounts of this great microfilming enterprise can be found in Edgar L. Erickson, "A Program for Microcopying Historical Material," *Jour. Documentary Reproduction* 5 3-29, 1942, and in William Jerome Wilson, "Manuscripts in Microfilm," *Library Quarterly* 13 212-226, 1943.

II

An archivist, or even a historian, reflecting upon our own age in contrast with others, might be inclined to call it the age of records. The great historian of medieval English law, F. W. Maitland, remarked fifty years ago that the habit of preserving written memorials of all important affairs had become so prevalent that it was with "a sort of continuing surprise" that the student of early laws and institutions realized that much of the world's business, even in communities by no means barbarous, had been carried on without benefit of records. So far as concerns that branch of records known as government archives, vast increases in their volume have resulted from the expansion of the sphere of political action and state regulation, what is spoken of as the growth of collectivism and is clearly one of the outstanding characteristics of our times. New departments and agencies of government, central and local, each with its own set of records, have come into existence, and the work of older departments has been greatly enlarged.

Since the climax of collectivism is reached in time of war—total war—it is then that the production of government archives attains truly staggering proportions. *A Handbook of Federal World War Agencies and their Records, 1917–1921*, recently (1943) issued by The National Archives, describes some 2,400 government agencies, emergency and permanent, and indicates, whenever possible, where their records are located. You will be interested to know that the records of the Office of Alien Property Custodian (1917–1934) combined with those of the Alien Property Bureau (1934-1941) run to 11,832 linear feet—more than two miles—in The National Archives. They are exceeded, however, by the records of Mr. Hoover's Food Administration, which last for 13,000 feet. I leave it to you to guess at the extent of the records, public and private, national, state, and local, to which the present war will have given rise.

What a paradise of plenty for the historian! Yet only one of Gargantuan appetite for historical sources could contemplate the prospect without some misgiving. "It adds materially to the horrors of war," says Professor Frederic L. Paxson, a veteran of war history, "to contemplate the mass of additional materials created thereby for the conscientious historian." Thoughtful students of history have begun to wonder what can be done about these embarrassments of riches. In an article entitled "Alice in Wonderland,"[10] Professor Roy F. Nichols recalls that for years historians

> have been preaching the need of the preservation of documents, the recording of evidence, the collection of every scrap as sure to have use for someone, particularly among the social historians. They have been taken at their word. Historical societies, libraries, state archives, and this great national organization [The National Archives] have risen at their behest and now they are literally hoist by their own petard. How are they to use the result, how are they to sit quietly, even in an air-conditioned room, and carefully examine and evaluate documents by the mile?

In our Army ambitious plans for historiography have been conceived and formulated, and the chiefs of the various historical sections are grappling with the problems caused by the avalanches of records descending upon them. There is, to be sure, a heroic remedy—the deliberate destruction of records—and archivists, especially in Europe, have for years been concerned with questions involved in this procedure. It is, however, one which conscientious historians have never been able to look upon with a light heart, whatever archival science or record administration may have to say about it. For the power to destroy records is the power to affect the future's knowledge of its past.

In any event, what is going on, as regards the records of American war activities, is careful collection and preservation, not destruction, and the war effort is so many-sided that it has produced, is producing, and will produce great quantities of records, even in small communities. The Committee on Conservation of Cultural Resources, to which I have referred, ceased to exist when the National Resources Planning Board came to an end some months ago, but under its guidance far-reaching projects for the collection and preservation of records of war activities were launched and are in operation in several of the states under the immediate direction of state committees.[11] In Minnesota, a commonwealth which was exceptionally active historically in the First World War and has not wearied in well-doing, a War History Committee has been established by Governor Stassen at the suggestion of the Minnesota Historical Society, one of its objects being to assure that adequate records of Minnesota's participation in the war will be made, collected, and preserved. In North Carolina, another historically minded state, local collectors of war records have been appointed in several counties.

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[10] *Am. Archivist* 3: 149–158, 1940.

[11] Lester J. Cappon, "A Plan for the Collection and Preservation of World War II Records." Social Science Research Council.

With a view to improving the quality and usefulness of the records of the war agencies of the Federal Government, a Committee on Records of War Administration was appointed by the Director of the Bureau of the Budget pursuant to a Presidential directive of March 4, 1942. It consisted of representatives of the National Archives, the Library of Congress, and a number of learned societies—the American Historical Association, the American Political Science Association, the American Society for Public Administration, and the American Council of Learned Societies. In the words of a member of the committee,

> We operate on the assumption that war agencies will accumulate their routine records without any help from us. Information that would be preserved in the normal course of operations concerns us only in the sense that we want to be sure that it is preserved. Our emphasis is primarily on the creation of records on administrative developments that ordinarily would not be documented . This work is deemed to be important not only for historical purposes but as a contribution to more effective administration in the immediate present.[13]

Speaking generally, historians have always been dependent upon records which were made without any regard to their needs or the interests of history. It impresses me as decidedly noteworthy that an effort is now afoot to consider the interests of history when records are being made. This new departure evidently has important historiographical implications.

I must not fail to mention what are probably, on the whole, the two most valuable collections of materials on the war to be found in this country—the Yale Collection of War Literature and the Hoover Library on War, Revolution, and Peace at Stanford University. The former was begun in September, 1939, and appropriately at Yale, which possessed important documentary collections relating to World War I, notably that which bears the name of Colonel House, of which President Seymour is curator. What might be called standard sources—government publications, leading periodicals, and important books—have not been neglected, but the Yale policy has been to specialize in more ephemeral publications, which are likely to be lost unless acquired promptly. The collection is notably strong in the records of American relief organizations, in propaganda put out by rival pressure groups in this country prior to our entry into the war; in propaganda emanating from belligerent European countries and governments in exile, in the literature of civilian defense and air-raid precaution, in Britain and France as well as in the United States; in army service newspapers, put out in camps in this country and abroad; and in posters. The Yale Collection was started under the supervision of a faculty committee, of which a historian, Professor Sherman Kent, was chairman, and those responsible for carrying on the enterprise are consciously working in the interest of history. They are trying to make it possible for the future historian to give answers to the modern equivalents of such questions as these, which have remained unanswered for want of evidence.

> What did the businessman in Jerusalem worry about when the city was under siege? Did Hannibal exhort the Carthaginians for better support of his army? . What did a plain soldier, far from his home in the Trans-Tiber, think about the Gallic wars? Were there pacifists in Greece, who deplored a costly and hazardous expedition to capture Troy?[14]

The original scope of the Hoover Library, which was to cover the First World War—its causes, conduct, and immediate aftermath—has been greatly expanded to include the more significant social and political movements of the post-war period and their culmination in the present global conflict. Soon after September, 1939, the Library's collecting agencies in belligerent and neutral countries began acquiring collections of all types of material relating to the present war—documents, diaries, newspapers, periodicals, posters, proclamations, etc., including many ephemeral and fugitive pieces. Some of this material has already been received at the Library, but the principal collections are being stored in the several countries of origin until the end of the war. Much attention is being devoted to building up the Library's collections on the United States, Canada, and Latin America. In the words of Miss Nina Almond, Librarian and Consultant in Research at the Hoover Library:

> *In this country we are now collecting files of the* foreign language press, publications of emigré groups

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[13] Harry Venneman, "War History and Records Activities," *Records Administration*, Circular 2, issued by The National Archives.

[14] Russell G. Pruden and Thomas C. Mendenhall, "The Yale Collection of War Literature," *Yale Univ. Library Gazette* 17: 14–20, 1942.

and governments in exile publications of organizations which represent shades of public opinion in this country, materials on minorities' questions, communism, labor, socialism, civilian defense, publications of conscientious objector camps, Japanese relocation and assembly centers, and publications of war-time governmental bodies and war-time publications of permanent government offices[14]

III

Projects for the writing of war histories have been set on foot by numerous departments and agencies of the federal government. They vary from extensive programs such as that of the War Department, with many historical officers and large secretarial staffs, to the more modest undertakings of smaller agencies, many of which have appointed persons of historical training to assemble documents and write up phases of the agency's work The Navy Department has commissioned our fellow member, Professor Samuel E Morison, as Lieutenant Commander and made him responsible for writing the history of naval operations in the war The Committee on Records of War Administration maintains a file of information regarding the plans and activities of war records projects and historical units of all agencies of the federal government.

The Army program for historiography is the most extensive and ambitious Shortly after Pearl Harbor the Historical Section of the Army War College submitted a master plan for historical work in the Army, which was approved in March, 1942 For a description of the progeny of this union of Mars and Clio, in the form of specific historical projects and historical agencies, and for changes and modifications that have been made in the original plan, I must refer you to articles on Army Historiography by Captain Victor Gondos, published in recent issues of the journal, *Military Affairs*[15] Some of the projects are very detailed, to put it mildly. The Historical Section of the Office of the Chief of Ordnance, for example, has planned a series of volumes, each to contain 200,000 to 300,000 words, dealing with small arms, field artillery, anti-aircraft artillery, machine tools, etc. In summarizing the aims of the Army program as a whole, Captain Gondos, writing last spring, said:

> The mission of the current groups of Army historical officers is to segregate and organize the historically significant material accumulating in the War Department and the various branches of the Army They are to furnish definite guide posts to historians and military students of the future

By a memorandum issued by the Adjutant General's Office on August 3, 1943, the objectives of Army historiography were greatly expanded and a new control unit, the Historical Branch, G2, War Department General Staff, was made responsible for the supervision of all Army historical work

The question of an official general history of the United States in the War has been under consideration Last December an informal conference called by the Archivist of the United States approved in principle the establishment of an official National War History Commission as an independent government agency responsible to the President of the United States, one of its functions to be the preparation of a general history or histories of the war A steering committee was appointed, consisting of representatives of the Library of Congress, the National Archives, the American Historical Association, the Committee on Records of War Administration, and the American Council of Learned Societies, but the proposed commission has not come into being, though another body, an Advisory Council on War History, has since been established which may act on some of the questions which would have come before an official War History Commission The present war has brought with it a renewal of interest along various lines in our experiences in the First World War, and it might be interesting, even instructive, to compare plans for histories of the present war with the projects—some of them rather grandiose and never completed—for histories of the earlier conflict[16] But time does not permit It may be worth while, however, to recall what Newton D Baker, Secretary of War, said in a memorandum dated August 4, 1919, in which he gave the *coup de grâce* to plans for an elaborate history of the war activities of the United States which had been worked out by the Historical Branch of the War Plans Division of the General Staff.

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[14] Nina Almond to the writer, October 20, 1943

[15] "Army Historiography in the Second World War" and "Army Historiography· Retrospect and Prospect," *Military Affairs* 7 60–68 and 133–140, 1943.

[16] Regarding plans for histories of the First World War, see Elizabeth B Drewry, "Historical Units of Agencies of the First World War," *Bull Nat Archives* 4, 1942, *Handbook of Federal World War Agencies and Their Records, 1917–1921*, 1943, Waldo G. Leland, "Historians and Archivists in the First World War," *Am. Archivist* 5 1–17, 1942.

> In a general way [the Secretary wrote] it may be said that the writing of history is the interpretation of facts in accordance with a philosophy Each historian has his own philosophy and his own method, and an official historian would be but one of many historians, and yet his philosophy and method would be stamped with approval while the deductions, perhaps equally sound, of other scholars from the same facts would not be so approved.[17]

I do not conceal my personal opinion that the Secretary showed statesmanlike discretion and historiographical wisdom

Some of the functions which would probably have been performed by an official War History Commission had it been created, have been assumed by a non-governmental agency, a Committee on War Studies appointed by the Social Science Research Council, with Roy F Nichols as chairman and the economic historian Shepard B Clough as executive secretary The program of this committee, which began work on October 1 of the present year, includes, as stated by the Social Science Research Council,

> mapping out the field of possible war studies, indicating the nature and location of research data, preparing memoranda on research problems in connection with various war functions and agencies, encouraging specific individuals and institutions to begin now collecting materials for later study, and emphasizing the importance of not losing all interest in war research the moment the armistice is signed

Provision has recently (November, 1943) been made for joint meetings of this committee and the Committee on Records of War Administration as an Advisory Council on War History under the chairmanship of Guy Stanton Ford, Executive Secretary of the American Historical Association.

IV

The effects of the war upon history considered as a professional human enterprise I can barely hint at. It is evident that the historical profession must share in the dislocations and disruptions which total war has imposed upon most forms of human activity. Its greatest physical calamities have occurred no doubt in the European countries which the Germans have occupied, but it has suffered its greatest shame in Germany, where it has become the handmaid and apologist of the Nazi regime (I am thinking of history in Germany in its organizational aspects, not of all individual German historians) It would be difficult to mention a greater professional degradation than that disclosed by a comparison of the leading German historical journal, the *Historische Zeitschrift*, as it used to be under the editorship of Friedrich Meinecke and as it has become under the Nazis

Our knowledge of events in the German-occupied countries is meager and unsatisfactory enough, but we know something of the blight which has fallen on intellectual life in general wherever the swastika flies, and we can be sure that history has not been spared Such matter-of-fact items as this, from a publishers' journal, show what has been happening "Literary production has ceased almost completely under the Nazis in Holland, and what remains of it is almost wholly given over to propaganda "[18] It is known that the Nazi terror in Poland has taken a lamentable toll of Polish historians, several of whom have died in German concentration camps According to recent Polish underground sources, some 600 out of 800 members of the pre-war Polish professoriat have perished It is probable—definite and reliable information is extremely difficult to obtain—that in the occupied countries a large majority of the historical journals have ceased publication, and that historical societies, generally speaking, have ceased to function

In this country, where the profession is carrying on, there have been notable shifts in the activities of its members I am not thinking of the many younger members who are in the armed forces and have withdrawn, for the time being, from historical work, but rather of those whose activities would be described as being still historical If there are fewer students in our colleges and universities to be instructed in history, there are many non-academic opportunities for the historically trained The *Mississippi Valley Historical Review*, in its June, 1942, issue, listed forty-eight historical scholars from American universities who were employed in a single office of the federal government, that of the then Co-ordinator of Information The demand for persons to render historical services in government agencies has been increasing so rapidly that the United States Civil Service Commission has formulated plans for examining and classifying historical specialists Ph. D's in history are no rare birds on the banks of the Potomac these days The prospect of the inclusion in the profession of a large bureaucratic element affords food for considerable meditation.

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[17] Quoted in Drewry, *op cit*

[18] *Publishers' Circular and Booksellers' Record* **157**: 387, 1943

Professor Chinard, in the paper on "Jefferson and the American Philosophical Society," which he gave us last spring, quoted these words from a private letter of Jefferson's

> These [scientific] societies are always in peace, however their nations may be at war Like the republic of letters, they form a great fraternity spreading over the whole earth, and their correspondence is never interrupted by any civilized nation

Jefferson would not have written those words if he were living today Modern war disrupts, as between belligerent countries, any elements of cultural internationalism that may have existed On the eve of the present war a beginning in international organization had been made in the historical world. A series of International Historical Congresses had been held, and an International Committee of Historical Sciences had been organized The last Congress and the last meeting of the full International Committee, of which our fellow member, Dr Leland, is president, were held at Zurich in the last year of peace, 1938 Rome, 1943, were the place and year fixed upon for the next meeting of the Congress!

V

Before bringing my remarks to a close, I venture to raise a question—one in which I have long been interested—pertaining to the philosophy of history I shall not stray far in this pasture, partly because it would be an abuse of your patience to do so, and partly because my qualifications as a guide are dubious I feel confused, a little giddy, somewhat like a cross between Rip Van Winkle and Alice in Wonderland, when a historian tells me that "history is not primarily concerned with the past" and a sociologist assures me that it ought not to bother about the truth.[19] I should like, however, to point a contrast between two different attitudes toward the past and indicate, very briefly, what appears to be the bearing of the war upon them. The questions at issue between them impress me as being momentous for the future of historiography, but I cannot hope to do justice to them at the fag-end of this paper The two points of view may be called present-mindedness and historical-mindedness Perhaps they can be put before you most quickly by means of two brief quotations The first, which is taken from the preface to *The History of Western Civilization* by Harry Elmer Barnes, a devoted disciple of James Harvey Robinson and one of the leading champions of Robinson's "New History," is that "history has no significance except in so far as it enables the reader more intelligently to understand the present" The second is from Henry Johnson's *Teaching of History* "History that traces development inevitably includes facts not directly related to the present Its fundamental question is not what matters *now* but what mattered *then*"

For a long time past it has been the fashion, especially in this country, to decry historical investigation and writing which has not aimed to throw light on the present as "mere antiquarianism," and this expression is always used with an inflection of contempt, implying that the past in itself is not worthy of serious study, that it becomes so only insofar as it can be made to illuminate us and our times I believe that this point of view—present-mindedness—has been and is a major source of anachronism and historical distortion, and in this connection I should like to read what impresses me as being a very penetrating sentence from a historical work by the seventeenth-century English antiquary, Sir Henry Spelman

> When states are departed from their original Constitution, and that original by tract of time worn out of Memory, the succeeding Ages viewing what is past by the present, conceive the former to have been like to that they live in; and framing thereupon erroneous propositions, do likewise make thereon erroneous Inferences and Conclusions[20]

Spelman lived long before men had begun to talk about scientific history, but he had a lively realization of one pregnant source of unscientific history A truly great medievalist, the late T F Tout, sagely observed that

> our natural absorption in the present has led us to study the past with minds too much set on present presuppositions We seek in the middle ages what seems important to ourselves, not what was important to them.

There can be no doubt, however, that the view expressed by Professor Barnes is very widely accepted—by champions of the "new history," exponents of progressive education, social scientists, journalists, and the public generally It is bound up with that cult of the present to which the dogma of evolutionary progress in human affairs has given rise, and it has been fostered by the pedagogical absorption of history in our schools into the "social studies" The social studies programs with which the schools have been busily experimenting during the last quarter century or so, and in which Clio appears as a humble maidservant and not as an exacting and jealous mistress, have no doubt aroused in pupils an interest in current social, economic, and political problems. I am even prepared to take into respectful consideration the proposition that they have awakened in our citizenry a keener sense of civic duty and have elevated standards in public life But so far as the philosophy of history is concerned, their tendency has been to strengthen a conception of historical knowledge as something that is worth while only to the extent that it helps to explain the society in which we live The accent of journalism and the radio is, of course, strongly on the present, and journalistic history, which is now flowering so luxuriantly among us, is preeminently present-minded

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[19] Edward Maslin Hulme, *History and its Neighbors* (New York, 1942) 8, Harvey W Zorbaugh, *New York Times*, November 16, 1941 "The history problem is not to give man a true account of the past, but to give him a useful account of the past."

[20] Quoted in Charles H. McIlwain, *The High Court of Parliament* (New Haven, 1910) 166.

It is gratifying to our self-esteem to look upon ourselves as the heirs of all the ages, but that does not justify us in supposing that the ages existed for the heirs Historical occurrences—what men have done and thought and felt—had a validity of their own They did not happen merely in order to be antecedents, to lead up to us We are not final in time any more than we are central in space. This is the thought, I take it, that was in the mind of Jacob Burckhardt, the nineteenth-century historian of the art and culture of the Italian Renaissance, when he said:

> Our profound and utterly ridiculous self-seeking first regards those times as happy which are in some way akin to our nature Further, it considers such past forces and individuals as praiseworthy on whose work our present existence and relative welfare are based Just as if the world and its history had existed merely for our sakes! For everyone regards all times as fulfilled in his own, and cannot see his own as one of many passing waves[11]

It has been said that our earth and its inhabitants are but a bit of star gone wrong It would be more sensible to think so than to mistake ourselves for that "one far-off divine event, to which the whole creation moves" In an address which my old and revered teacher, William A. Dunning, delivered as president of the American Historical Association in 1913, he suggested that a spirit of temporal humility was the crying need in historical study today "Our pride in the attainments of our own day," he said, "distorts all our judgments of the past" Confidence in a self-propelling and inevitable progress may have suffered some damage during these last thirty years, but I fail to detect any trend in the direction of temporal humility The twentieth century may be concerned about the future; it must be or it would not be planning so assiduously But it has few doubts that it is immeasurably more important than any of its predecessors

Present-mindedness reaches its climax in time of war because it is then that the impact of the present is most intense Current events fairly scream at us—in newspapers, on the radio, at the movies How can the past hope to compete with all this uproar? The only kind of history that can make any considerable appeal in time of war is that which is designed to fill in backgrounds to the present, and this Second World War is producing bumper crops of this kind, written largely, as would be expected, by journalists and publicists The literature on the roots of Nazism, to take a single example, is already very extensive, and it is of course thoroughly present-minded One hardly needs to look into a book—its author happens to be a university professor—which bears the title *Germany the Aggressor throughout the Ages* to be sure that it contains the normal fruits of present-mindedness—over-simplifications, false analogies, and historical distortions There are signs that point to the establishment in our universities, on a larger scale than has hitherto been attempted, of regional institutes in which the history of particular areas will be integrated with a study of their languages and existing economic, social, political, and cultural conditions Whatever might be the merits of such educational organizations, we can be pretty sure that the function of history in them would be only to serve as background for the present.

There is no good reason to suppose that the present war is the prelude to utopias (social, spiritual, or intellectual), that the human race, like the prince and princess in the fairy tale, will live in perfect happiness ever after A thoughtful student of American social history, Professor Merle Curti, has emphasized the tendency of our previous wars—the Revolution, the Civil War, and the First World War—to discourage rational, dispassionate inquiry and to give a strongly utilitarian character to intellectual activities, as well as to popularize knowledge[23] Expressed in terms of historiography, the sum of these tendencies is present-mindedness, and there seems to be no doubt that they are powerfully at work in the present war If so, they may be expected to have their effects in the years immediately ahead on the study, writing, and teaching of history The temper of our day is not favorable to looking at past events in that spirit of historical relativity which is the essence of historical-mindedness

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[11] *Force and Freedom: Reflections on History* (New York, 1943) 358.

But I would not close on a note of long-range pessimism The human race, in all probability, has a very long secular future ahead of it, and extreme present-mindedness may be only a passing phenomenon

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[23] "The American Scholar in Three Wars," *Jour History of Ideas* 3 241-264, 1942.

MERCHANTS OF LIGHT: SCHOLARSHIP IN ARTS AND LETTERS

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(Read November 20, 1943, in Symposium on the Organization, Direction, and Support of Research)

More than three centuries ago Francis Bacon predicted many things which have come to pass In the little epilogue to his philosophical works, the *New Atlantis,* he prophesied a world transformed by science, not, as most utopian writers expected, by changes in government, law, society Among the long list of inventions made by the "Fathers of Salomon's House" there is almost nothing which we do not use today The modern world *has* been transformed by science, and through that transformation has arisen the state of affairs in letters which I discuss upon this occasion

In the *Advancement of Learning,* Bacon made a different kind of prophecy, pertinent not only to scholars in my own field, but to all of you who represent so many others He said that the advancement of learning would be opposed by three groups of powerful men divines, politicians, and men of learning; he further prophesied that the most serious of all these foes would be "the men of learning themselves" The extent to which the kind of learning emphasized by Bacon encountered opposition from divines is familiar enough, today the long "warfare of science and religion" seems almost to have ceased. Bacon's sections on the opposition to learning by politicians, however, will bear rereading. Whenever there is a flutter in the dovecotes of Washington about "academic theorists," who threaten the big bold business men, let the "professors" turn for comfort to Bacon who, told us in 1605 that these things would be, and, more clearly than anyone in Washington today, told us why these situations recur. But when you have read these paragraphs for your comfort, do not stop there. go on with Bacon's discussion of how "learned men" hinder learning The advancement of learning has been opposed by learned men, today, I fear, we ourselves are its chief foes.

From Bacon the seventeenth century caught fire During his lifetime his ideas were not particularly influential, but shortly after his death they began to spread among a younger generation, and from 1640 were more responsible than any other one source for the widespread popular interest in what we now call "science" To some extent the ideas of the *New Atlantis* were embodied in our ancestor the Philosophical Society of Oxford; they were still more fully developed in our *alma mater,* the Royal Society of London, which rapidly became one of the most powerful societies in the world

In Restoration years, shortly after the chartering of the Society, we find a conflict, both within and without the Society, among "learned men" concerning the direction which the "Advancement of Learning" was to take In the early Royal Society, of course, membership was not limited to "scientists" Many leading divines signed the book; men of letters—dramatists, satirists, poets—were regular attendants at meetings It was a "Philosophical Society" in our sense of the word; *philosophia* was a term as familiar as *scientia* Within the Society, one group which opposed the advancement of science consisted of men of letters who made every effort to divert the Royal Society from scientific experiment, hoping to make it a "British Academy," which like the French Academy, should establish rules for spelling and grammar, and declare what was "right" and "wrong" in style and literature. One of the most powerful committees of the Society was made up of such men of letters—Dryden was one of them —to some of whom the scientific preoccupations of the organization seemed absurd and even dangerous Shadwell's *Virtuoso* will show the kind of satire written against the Society, relished all the more by men in the audience who were members. A little later, Swift in the third book of *Gulliver's Travels* took his fling at the activities of the Society, though with his usual ability to pulverize everyone, he managed to reduce some men of letters to the same indistinguishable dust and ashes. The controversy between the "sciences" and the "humanities" was in full swing.

Outside the Society the attack was even more vigorous. The establishment of the Society, under the King's charter, fanned to hotter flames

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the long-smouldering controversy between "ancients" and "moderns." The quarrel became specifically one between the "ancients" who were the "humanists" and the "scientists" who were the "moderns." The position of the humanists was clear enough. "Ask for the old paths, which are the good paths and walk therein, and ye shall find rest for your souls." But to those words of wisdom another "perverse and crooked generation" replied "We will not walk therein." In the universities developed a struggle between those who tried to force science in as a "discipline" and those who tried to keep it out, in order to retain the honored emphasis upon *trivium* and *quadrivium*. In literature the war caused in both England and France a slight but famous skirmish, the "Battle of the Books." Whatever the ultimate source of the quarrel in France, there is no question that in England this battle was not primarily a literary quarrel, but a part of the larger war between the "humanities" and the "sciences." Because of the brilliance of the one major literary work produced in England, Swift's *Battle of the Books*, we are likely to forget that Swift fought on the losing side, that the battle was really won before he ever broke a lance. To students of literature Swift may overshadow the scientists, but historically the scientists overshadowed Swift and all his party. They won the battle, and they won the war.

It was in this period then that we began to part company—unfortunately for all of us. During the next two centuries the sciences continued to gain ground, the humanities to lose it, to pass into the twilight of the gods. Yet so strongly was the humanistic tradition entrenched in the universities, that its gradual weakening was not obvious for many years. Even in the nineteenth century, we are told, a mistranslation from a classical writer, or a false quantity uttered in the House of Commons, caused all England to shudder—and the outposts of Empire to tremble! The effect of Renaissance humanism had been powerful indeed, perhaps the effect outlasted the humanism.

In the latter years of the nineteenth century, however, the "ancients" encountered new "modern" foes who were to be even more responsible than the sciences for the final fall of the long classical tradition: the modern languages and literatures. I hold no brief for the behavior of these young "moderns" as you will see, yet I cannot justify the position which the "ancients" took, though I say this with deep regret, for in my earlier days I wanted to be an "ancient." I was weighed in the balance and found wanting. Far from regretting the years which I spent in the study of Latin and Greek, I know that no part of my education was more important for me as a teacher of English. Yet for all my allegiance, I cannot defend the "ancients" in their treatment of the new "moderns" at the end of the nineteenth century. The classics would be more powerful today had they admitted these younger relatives into their fraternity, for the modern literatures and languages would have aided them. These literatures and languages made their way slowly into academic halls, and even today those still younger relatives, the "arts," are not considered respectable in many institutions. We in America have given some slight academic recognition to music and the plastic arts, England almost none. In few institutions of learning, even in America, are the "arts" admitted on a par with other branches of the curriculum.

What happened when these new "moderns," languages, literatures, and arts, began to seek admission to universities, was brought home to me powerfully a few years ago when I was delegated to prepare for the half-century index of the *Publications of the Modern Language Association of America*, sections dealing with the presidential addresses. If the experience was tedious, it was also illuminating, because it permitted me to follow, year by year, the difficulties and the progress of the new "moderns." During the first two decades, I found, modern languages and literatures encountered their chief adversaries among the classicists, who refused to consider that these poor relations warranted any place in the sun. It was clear that the presidents of the Modern Language Association reflected a feeling of inferiority, based upon the charge that modern languages and literatures were "easy," and therefore could not be considered a "discipline"—since "disciplines" must obviously be "difficult." At this point the modern languages and literatures made their first serious error in strategy. They attempted to make their "disciplines" difficult by building up entirely arbitrary but very heavy requirements in Germanic languages for all advanced candidates. I trust that I am not being too irreverent to these dead and gone Presidents of the Modern Language Association when I say that the argument seems to have run this way: "Well, perhaps English, French, Spanish, Italian *are* easy, but German is *hard*—and the older it is, the harder it is. There is just as much memorizing in learning Old High German, Middle High German, and Gothic, as in learning Greek and Latin; and if we add

Old Norse too, surely we will be *hard enough!*" They seldom went further and indicated a more fundamental justification for the extraordinarily heavy requirements which for many years persisted in graduate schools The value of such Germanic training to students of early fields is obvious enough, but wherein its value lies to students of the Renaissance and later periods many who suffered from the requirements never learned, nor did the Presidents tell Even now such requirements still hold in some graduate schools, and at least vestigial traces are to be found in most We still suffer from that old inferiority complex, we are afraid that English is too easy—and so we hedge it about with artificial requirements which will frighten students and permit us to boast to colleagues in other departments that ours too, is a stern "discipline"

As I see it, the modern literatures here made two serious mistakes from which they have not yet recovered In the first place, they parted company with the classics They ceased to insist that students working in modern literatures, in periods from the Renaissance on, must have classical backgrounds One of my colleagues at Columbia mentioned only this week that when in the first decade of this century, he was invited to teach one course in the eighteenth century, another in Romanticism, the senior professor inquired scrupulously into his training in the older Germanic languages, and, finding that he knew no Gothic, made him enroll for a course; never at any time did that officer inquire whether this teacher of neo-classicism and Romanticism had studied Latin or Greek There lay our first serious error; because of the "spite-fence" which had been built up between the classics and the modern languages, we sold our classical birthright The other error was this when the modern languages were on trial for their lives, they attempted to fight their adversaries by using the weapons of the adversaries, not by forging their own For one set of "linguistic" requirements, they substituted another They did not prove their case by showing that they too were "humane," that in another way they offered to growing minds and spirits some of the values which earlier generations had gained from classical study This tendency to fight with the adversary's weapons, not to forge our own, I regret to say, marks each of the successive chapters.

If I may trust the presidential addresses, about the beginning of the present century the modern languages faced a different antagonist The twilight of the gods, so long threatening the classics, was becoming deeper; they ceased to be important adversaries. Instead of the classics, the presidents now inveighed against the growing power of the sciences as "disciplines" And again, I regret to say, scholars in the fields of modern languages made the same strategic error as before. No one had ever denied that science was "hard", in this way it was a foeman as stalwart as the classics had been But in addition, the sciences had the advantage of exact methods, and (this was still more difficult for us to bear!) methods which really *worked*, because they reached Truth —which is the common end of us all And so we in the modern languages again tried to seize our opponents' weapons, and cut ourselves badly by so doing We asserted valiantly that we too had a "scientific method"—and we went to Germany to study it, for Germany before the first World War was the great home of the "scientific method" in modern languages and literatures This was the flourishing period which I call "The Great Age of Facts and Footnotes" We dug, we uncovered, we weighed, we measured, we verified, we overwhelmed our readers with "proof" I am not denying that we learned something during this period—if only respect for stubborn and irreducible facts We added cubits to the stature of knowledge—even if it was usually only knowledge *about* literature. This was the era of discovery in biographical facts, in facts about literary forms We even discovered "laws" —presumably laws of Nature. I do not, of course, deny that there may be laws governing the development of language; we have such laws, and I may assure my scientific hearers that they would sound as imposing to them as Kepler's or Boyle's to us. But at the risk of losing my academic status I declare that I do not believe there is any such thing as "the scientific method" in the study of modern literatures, or indeed of any literature Our naivete was never better shown than in the vague suggestion that there is just one "scientific method," common to all sciences and to all workers in the same science. I believe that through literature we can arrive at Truth, but I do not believe that we do it by following something vaguely called "the scientific method"

During the years immediately following the first World War, there was much less talk of this scientific method on the parts of the presidents. Another dangerous foe raised its ugly head—ugly at least to us, but beautiful to students who were drawn from us in large numbers by the growing popularity of the "social sciences" (that very name would seem to indicate that they, too, had gone through an experience similar to our own) Once again we tried to fight with their weapons, we still had not forged our own We boasted to the historians that we too had an "historical method", so we have, though it is hardly our only important possession We tried to show that we can use "the statistical method" just as well as any economist We can count all manner of things "end-stopped" and "run-on" lines, "parallel" passages, the number of allusions to something—indeed anything!—in a given author; recurrent figures of speech. From such study we can sometimes deduce "laws," and we can always show something of extraordinary significance What is more, we too can make most imposing charts of our findings In the hands of such a scholar as Miss Caroline Spurgeon, weighing, counting, measuring has its value, for Miss Spurgeon could rise above her imposing charts, but in lesser hands —and there have been many—I fear such tendencies have done more to veil the bright countenance of Truth than to illumine her face

Very recently we have been face to face with still another antagonist psychology The psychologists, too, had felt the pressure which led the modern languages to talk about a "scientific method," and led the "social sciences" to claim their part in science In our own time we have seen psychology leave its place in philosophy to assert that it too is a science We scholars in modern literature have felt the pressure of psychology, as of the classics, the natural and the social sciences What have we done? We have tried to take over the methods of the psychologists; particularly, amateurs though we are, we have ventured to apply the "method of psychoanalysis" in order to explain the "savage indignation" of Swift, the effect of frustration in marriage upon Milton, the extent to which our various opium-eaters were made great writers by poppy or mandragora Again, we have used the weapons of our adversaries Yet here above all we should have asserted our strength If we must fight with our psychological colleagues, attempting to prove our superiority, we need only say, in full consciousness of our "priority" "Dear colleagues in this great field of learning, centuries before you wrote learned treatises to explain *why* men behave like human beings, poets, dramatists, and satirists showed how human beings do behave, and showed it better They were the first psychologists!"

Such is the historical background of the condition in which the modern languages find themselves today, as I see it We have exhibited our weaknesses, we have not developed our strength Among all the errors we have made, I believe our most serious lay in departing from the classics, in helping to break down the great humanistic tradition So permeated with the classics are modern literatures—at least from the Renaissance down through the nineteenth century—that we are in danger of not being able to read our own language or literatures I remember an essay of Paul Elmer More's which appeared in the *Nation* about 1910, which began in this way "If it be true that there are in this country teachers of English literature who know no Greek " So quickly has the whirligig of time brought in its revenges that it will soon be impossible to find in this country teachers of English literature who know a word of Greek. I think it was Paul Elmer More, also, who said, in that essay or another, that all the time he had spent on the study of Greek was justified if only by the fact that he could read *Lycidas* We sowed the wind, we reap the whirlwind There are teachers of English—indeed scholars of English—who teach and write about *Paradise Lost*, though they never read Homer, never even read the Aeneid in the original —and probably not all of it in translation, the same teachers and others discourse learnedly on the structure or the spirit of *Samson Agonistes*, though they have read no Aeschylus, Sophocles, or Euripides Young would-be scholars come to me, wanting to write dissertations on Pope's satire, though they know little of Horace and nothing of Juvenal, they speak of the "harshness and obscurity" of Donne's satires (having read those words in books), having no idea who Persius was or how he wrote They believe that certain tendencies in style sprang full-grown in the seventeenth or eighteenth centuries, because they know nothing of the long rhetorical traditions of Greece and Rome Our abortive attempts to follow the methods of the sciences, or even of the social sciences, have made us poorer rather than richer We are to blame—our predecessors and ourselves—for permitting this state of affairs to come about If in this perilous time in the world's history we cannot justify ourselves more fully than in the past, we shall perish

There is a lesson for us, as there was for Ernest Hemingway, in that poignant passage in the *Devotions* of John Donne, which begins "From the Bells of the Church adjoining, I am daily reminded of my Burial in the Funerals of others" We must remember what some have forgotten, with sad consequences

> No man is an Island, entire of itself, every man is a piece of the continent, a part of the main If a clod be washed away by the sea, Europe is the less Any man's death diminishes me, because I am involved in mankind Therefore never send to know for whom the bell tolls, it tolls for thee

It is natural that in this period of world-sadness we should be more conscious than before of our faults and shortcomings In that very consciousness lies our salvation Like Bacon in the *Novum Organum*, I turn from what he called "the reasons men despair," to say in his words "I am now to speak concerning Hope" Certain fundamental reforms must come about in our academic world, I believe the time is ripe, and that we shall bring them about I have sat on various commissions which are considering plans for the future, nothing has more impressed me than the willingness of these men to work together in the future as they have not always in the past I have found presidents and deans—and even alumni!—forgetting past petty jealousies between their institutions, realizing that each of them is no island but a part of the mainland feeling their responsibility less to the glory of *alma mater* than to the future of American education

For two "reforms" which must come about we are all responsible—you as well as we For three hundred years we have permitted the departmentalization of knowledge to go on apace Of course I know it is no longer possible for us to go back to the days when one man believed that he could take all knowledge to be his province Yet can we not come closer together than we have been for many years? Surely in this period of devastation and wholesale carnage, of global warfare, we can forget our little battles of the books, our petty jealousies of each other's "fields." The great field of knowledge is our common heritage; we hold it in trust for the future Is it not large enough for all? Must we like nations fight for colonies, for prestige? In the current number of the *American Scholar* appears an article by Dr Howard Adelmann of Cornell University, from which I shall borrow without his permission. As a scientist he writes to his colleagues in the humanities, calling his article "The Fence." In the field of knowledge, as he says, we have erected fences Fences may be good things, or they may be bad if used for bad purposes Too often in the past they have become "spite fences," built through jealousy, cutting us apart from one another Sometimes, as Dr. Adelmann says, when our work is over, we lean across the fence and talk to a neighbor on the other side, discovering to our surprise that he is not a bad fellow after all Sometimes, indeed, our neighbor makes a valuable suggestion about our own plowing and sowing based on his own experience in his field In our zeal to be Good Neighbors to more distant fellows, shall we forget the good neighbor across the back fence? "Good fences make good neighbors", spite fences continue enmities

If I seem to have criticized workers in my own field because they tried to model themselves on the classicists, then on the natural and social scientists, finally on the psychologists, let me say in our defense that at least we have been zealous to learn from all of them They have taught us much. Perhaps in their turn they may learn from us We have gained by studying the "historical method" of the historians. They must not resent the fact—as some of them do—that literature also has its history, and that it is legitimate for us to study it. We are fellow-workers in that field Milton was "Oliver's Secretary," and as such a part of political history, but *Paradise Lost* would have been a different epic had Milton not fought in the years of reconstruction. Social scientists must believe that poetry, essays, drama are as legitimate expressions of the spirit of man as the works of John Stuart Mill, Adam Smith—or even Karl Marx Novelists and poets, as well as sociologists, have done much to correct abuses in slums and prisons, in child labor and sweat shops. Swift's *Modest Proposal* was more effectual in bringing about certain reforms in Ireland than any economic treatise of the age And, as I have said, fiction, drama, and poetry taught man much that he knows about mental states—normal and abnormal—long before psychology became a science We have one common end: the search for Truth There are "divers members, but one spirit."

Another problem too we share in common, never more acute than in this period If I enter upon it with some hesitation, that very hesitation is significant This is a "learned society"; when I enter its doors I feel that I am expected to devote myself to problems of "scholarship" and "research," and not to deal with problems of "education"—a word which has fallen into sad disrepute. But because I believe in what I am to say, I shall say it, even though I fall from "scholarly" grace.

There has grown up an artificial and serious distinction between *research and scholarship* on the one hand, and *teaching and education* on the other Some scholars believe that research should be dissociated from teaching Perhaps in a better world such a distinction may be possible It is not possible in this world in which we live at present. To be sure there are some research chairs in universities, and more among the foundations, particularly those devoted to science But there are few in the social sciences, the languages, the literatures Whether we like it or not, we must accept the fact that the great majority of scholars in the United States earn their living by teaching Sometimes they do it grudgingly, feeling it an interruption to more important work More frequently they become so engrossed in teaching—or at least so cluttered up by its duties—that their research suffers We all know this, yet some of us continue to act as if the two professions were separate

I believe it is high time that scholars as a group paid more attention than they have not only to *what* is taught but to *how* that teaching is carried on in every part of our educational system The teaching in many graduate schools is, I fear, the worst teaching of all! As some of my students say "Graduate students expect to be bored—and they are seldom disappointed!" But the scholar should concern himself not only with the graduate school, even more important is the kind of teaching and the subject matter in the undergraduate college, the secondary school, yes, even the elementary school In these lower but not less important divisions the training of potential scholars of the next generation is going on We criticize the results; how much attention do we pay to the process? Except in so far as they are parents, scholars infrequently concern themselves with elementary and secondary education, and their experience as parents is often limited to one school or at most a small group of schools I know, of course, that some of you will say—with that expression I know so well: "Of course she was a Dean; and she can't get over it." I was a Dean for twelve years and I am grateful for the experience; but I hope I was a scholar before that time, and I should like to think that I am still a scholar. As a scholar I am profoundly concerned with education at all the lower levels. I should like to feel that all of you have followed closely the "transformation" of secondary and some elementary education which has come about as a result of the war, have read the statements of certain superintendents of great public school systems, telling proudly how they "transformed" education in short periods, from one to six weeks Many of you are house-owners as am I, you may remember the "transformation" of our furnaces from oil to coal, which we found somewhat difficult Is the transformation of education so much simpler? Should it be? All of us know what the emergency has done to the training of potential scholars in undergraduate institutions for men and in coeducational universities We realize that—for reasons which we all respect and understand—the training of scholars in those institutions is temporarily almost in abeyance But the cultural lag in the next generation will be even more seriously affected by what is happening in the secondary and elementary schools We should know what is happening and be ready to adjust ourselves to it, even if we cannot correct it This, too, is a common problem, for this transformation of education on a wide scale will affect us all

Yet while the war is having an adverse effect upon some phases of education and scholarship, it is also giving many of us "reasons for Hope" At this meeting, as at many other meetings of learned societies, we are hearing some of those reasons To be sure, we are all suffering from pessimism to some degree, but it is not entirely unmixed with optimism Everyone knows that war stimulates certain branches of science, even though it may affect others adversely Certainly it challenges the social sciences The historians have history made to their hands, and seem to be improving their opportunities as never before Professor Schuyler's amusing account of the miles of records which are being accumulated certainly implies that there will be no dearth of materials for doctoral candidates in history for many generations! The experiences of economists in Washington—good and bad—cannot fail to have an effect upon them and their subjects when they return to academic halls "Statistics" has ceased to be a mere subject taught in colleges, and has gone to war The part played by theoretical sociologists and practical social workers in rehabilitation and reconstruction may well be great All of us have followed with interest and appreciation the work of psychologists, not only in determining aptitudes of men and women for the kinds of active service in which they are of most value, but in working on the field of combat and in later treatment with the readjustment of men suffering from abnormal conditions inevitable in war.

In my own field of modern languages and literatures, the most immediate effect of the war has been, of course, upon methods of teaching modern languages, together with the sudden introduction into colleges of some modern languages which had never been a part of the curriculum Popular articles have drawn the attention of the general public to the "intensive training programs" of the Army and Navy, which seem entirely new They are not, of course The general techniques and the principles involved have been familiar to teachers of language for many years, somewhat similar methods were in vogue in colleges and schools of languages long before the war attracted attention to them We are familiar, too, with the part that the American Council of Learned Societies was playing in such experiments before they were adopted by the Army and Navy Yet there is no question that the widespread general interest in these intensive methods of teaching and learning languages will prove a challenge to departments of language when the war is over They will have to decide in how far these methods are valuable for languages needed for peace, not for emergencies of war They will have to counteract popular belief that the one real value of language study consists in the ability to speak and understand a language so that one can communicate with natives—whether in French, German, Spanish, Malay, or pidgin English Yet though they will face some difficulty in explaining to the general public the difference between language for war and language for peace, they will be assisted in their efforts by another aspect of the Army-Navy programs the training for "area" work in occupation and rehabilitation As a result of those experiments, many branches of the humanities will receive new life, we shall come more closely together The public will learn that this sort of training requires language not only for practical purposes of intercommunication about problems of everyday life, but as a key to the culture of a group or race They will see that training for such work involves language, yes, but only as the first key; it involves knowledge of the literature, history, economics, anthropology, law, science of the peoples concerned.

' The one field of learning which does not yet seem to have experienced new stimulus from war is my own field of English literature and language This is not to say that we have not felt any effect from the Army-Navy programs. Unhappily both the Army and Navy have made public our weaknesses. They have found that a large number of young men—some of whom had had many years of "English" in school and even in college—cannot read, cannot write, and cannot speak! It is small comfort to us to know that they have also criticized training in mathematics I trust I have already made clear the reason that such criticism against the teaching of reading, writing, and speaking in elementary and secondary schools should be a matter of concern even to scholars in graduate schools We have been aware of some of these deficiences in our own students, have criticized the schools and colleges, but have done little or nothing by way of correction The charge against teachers of English is even more serious than that against teachers of mathematics On paper, at least, English is a required subject of study in every year of the elementary and secondary school; there are few colleges which do not require at least one course in the subject To be sure, we may shrug our shoulders and say that mastery of reading, writing, and speaking belongs to the elementary schools, not to the colleges and graduate schools. These conditions have come about because we, who should be the leaders, have been content to leave all such "elementary" matters in the hands of "elementary" teachers In so far as we have been familiar with the requirements for training of these teachers, and with the methods used in various parts of the country, we have sometimes criticized, we have done little more

If these problems seem remote from us as scholars and advanced teachers of English, I suggest that they affect even so-called "higher studies" One charge constantly brought against American literary scholars by their British peers is that our "scholarly" articles are badly written. I am afraid that that is true. British scholarship has its faults, but the level of good writing is much higher than with us Somewhere along the line they learn to express themselves not only clearly, but often gracefully, sometimes beautifully But there is more to our defect than training somewhere along the line. For reasons too complex for analysis here, though some of them have been suggested above, we professors and scholars of literature seem to be "afraid of that which is high," afraid of writing well for fear that we may be considered "unscholarly." Is it equally "unscholarly" to speak well, in the classroom or without? It must be—since so many of us feel constrained to write our lectures, and sometimes deliver them so that we cannot be heard!

As to the place of reading in our educational system, I should like to call your attention to one of the best "reports" of various commissions which has come to my attention, a paper written by Professor Howard Lowry of Princeton University for the Modern Language Association Unlike some of our colleagues, and unlike many other writers of reports for commissions, Professor Lowry has dared to write well, so that his paper, "Literature in American Education," is a contribution to literature He has not dealt with problems of learning to read, but with problems which beset us in the kinds of reading encountered by students in schools and colleges The introduction to this report begins with a quotation. "The trouble with German education in the last generation was that it produced men who liked books," a statement which occurs in no less important a source than Hitler's *Mein Kampf* We are proud, not ashamed, of the fact that our kind of education has produced men who like books, who do not fear them and find it well to burn them. Yet Professor Lowry's report shows that even in this free country, certain forces are at work which, if unchecked, may seriously affect our love of books. Some of those forces are, as in Germany, political; they arise from a group whose political prejudices make them feel that "letters" are undemocratic vestiges of a former "aristocratic" system of education Other groups would do away with the great "classics" of English literature in order to make time for more "practical" subjects. Others, following certain educational theories, believe that "English," at least in the schools and early years of college, should concern itself not with reading dead authors, but with "self expression." In so far as reading is a part of English, it should be reading in the current, the contemporary, reading, as they say, "related to life" Only the "moderns," it would seem, have lived, loved, suffered, rejoiced —written All these forces, together with many others, are conspiring against reading, either as a discipline or as a pleasure.

Yet, as Mr. Lowry implies, once we have given to the many even the simplest power of reading, men and women will read. True, their reading may be only the headlines of the newspapers, the advertisements on billboards, in busses and subways, flashing signs in neon lights—or even the letters in alphabet soup! But read they will What they will read, how they will read it, in how far they will be capable of judging it—that remains our problem, and one which we cannot avoid or neglect A little knowledge of language and literature may be a dangerous thing. In that great South American classic *Ariel* we in North America are condemned as the "Calibans" of the modern world You remember what Caliban said to Prospero, who had lifted him up one step from savagery "You taught me language, and my profit on't is, I know how to curse" Statistics show that ten million Americans read the comics Is our reward for putting in the hands of the many the power to read to be another retort from Caliban "You taught me reading and my profit is —I read the comics"?

From our reading, more than from any other source, comes broadening and deepening of experience, the power of sympathy for many men and women whom we may not know in reality, but whom we know intimately in great books. Reading may be escape, but it may also be a fuller and richer entering into life The position of the teacher of English, at every educational level, is, I believe, a central one To us are entrusted the most serious responsibilities, in educating both for "making a living" and for "living" (terms which seem mutually exclusive sometimes when we fight over "vocational" and "liberal" education) Reading, writing, and speaking are essential, success depends upon our skills in these supposedly simple matters. Men and women sit and stand in high places because they have developed one or all these skills to high degree It is no disrespect to other qualities of leadership to say that Mr Churchill's most signal success in uniting not only his own people but ours under his banner has come preeminently from his ability in reading, writing, and speaking In addition, teachers of English are more responsible than any other one group for training a generation in thinking For one student who today studies logic as a discipline, there are ninety-nine who study English

Even apart from these essential skills, to us, more than to any others, is entrusted the development of "values" in youthful minds and spirits Only a small number of students reach the point of studying aesthetics or ethics Some, of course, are led to determine their ethics by churches and pastors, as in preceding ages, the majority are not Some study art and music; the majority do not. All study English From simple reading in tales and even nursery rhymes, through more mature reading in novels, poetry, drama, essays, they gradually develop their theories of right and wrong, good and evil, ponder, even in a simple way, absolute or relative standards, determine their courses of conduct. In emotional crises, in moments of joy or grief, perplexity and confusion, they turn more often to literature than to theology and philosophy A poem read years before and almost forgotten, a conflict in a drama—perhaps only vaguely understood when read—a wise sentence in an essay written by another man, ancient or modern, who also lived and suffered or rejoiced—these serve to clarify, to explain, to heighten emotional experience What we have read, how we have read it—upon this depends much of our intellectual and emotional maturity, much of our ability to see life steadily and see it whole

If I seem to you to overstress our function as teachers, I am not for a moment denying our functions as scholars The two are in no way inseparable, rather they are parts of a single whole. We must, at every level of education, be wiser than our students, we must have read more widely and more deeply, we must have thought longer and thought more clearly We must understand the literature we teach as fully as is humanly possible There is no one "method" which will inevitably lead to such understanding Literature may be approached from many angles, and provided it leads to fuller and richer understanding of the literature itself, any method is legitimate and valuable It is our function to enrich our own experience It is equally our function to attempt to enrich others, whether by the spoken or the written word "Get wisdom, get understanding" "Let your light so shine . ."

You will think that I have forgotten the title from which I started too long ago I began with Bacon, and I return to him Lord of language that he was, Bacon delighted in figures of speech, of which few have been greater masters Of all the figures which illuminate his pages, those drawn from light are the most striking and most beautiful Light is everywhere · in the kind of truth which like the pearl "sheweth best in varied light," in that which, like the diamond, responds to clear white light His great passages on the search for and discovery of truth are couched in figures of light · some men peer into dark corners by the light of a candle, others set up a great torch in the center of a dark room. Most of all, Bacon drew his light-figures from the story of the Creation as told in Genesis on the first day God created the light of the sun and moon, on the last day He created the light of man's intellect. In spite of his rhetoric Bacon stressed always the practical. Thus it is that one of his most characteristic figures of speech is the title which he gave to a group of the learned fellows and scholars of "Salomon's House," the group of travelling fellows who set out from the New Atlantis with ships laden with goods for barter and exchange, but who travelled for no material gain, who returned, we surmise, with empty ships, but with full minds, because the one commodity they sought to buy was *light* If this seems idealistic, let me remind you that Bacon was the most practically minded man of his generation Yet he did not avoid great thinking—nor yet great language Our problems are practical problems, and at the moment immediate problems. Yet they are lofty problems for the future Like these fellows of an almost forgotten learned society, on our island of the New Atlantis, we too must accept the responsibilities of our proud calling as "Merchants of Light"

WAR AND RESEARCH IN SOCIAL SCIENCE

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(*Discussion in Symposium on the Organization, Direction, and Support of Research, November 20, 1943*)

The effect of war upon research is paradoxical. While its demands disrupt many projects and long-term programs, these same demands produce new and more streamlined activity. The disruptions and diversions stimulate a pessimism among scholars which is deepened by the historians' report that scholarship tends to decline in post-war periods and to be diverted into channels of less scientific usefulness. However, certain of the streamlined projects which have appeared during this war invite a more hopeful outlook for the immediate future, that is, if they are effectively developed. Reference has been made above to some of these new conditions, particularly in history.[1] Further attention may be here devoted to the situation in social science in general.

The scholarly mobilization which has been going on since the beginning of the war has brought to government service and particularly to Washington probably the greatest aggregation of social scientists which has ever been assembled in one place. The possible effects upon scholarship which may arise from their work, and the problems which must be met if their efforts are to be capitalized, may be illustrated by reference to their activities in three areas of concentration.

The first of these is the study of population.[2] The overall command in planning global war had to know as much as it could discover about the people and the material resources of the globe. Population and resources studies had to be undertaken on a large scale by geographers, sociologists, statisticians, economists, and others. There was need for accurate knowledge of enemy peoples, of societies over which the United Nations might have to exercise military administration and to which they might need to grant relief. Demographic characteristics, customs, language, religious beliefs, in fact everything making up the individual and mass psychology of unfamiliar peoples, and their physical resources as well had to be studied and the information mobilized in practical usable form.

The results of this war need are significant. A great bibliographical concentration has been organized in a special collection at the Library of Congress. Experts on all these varied areas have been called together by various agencies and are working in reasonable collaboration, not always without overlapping and duplicated effort as shown some time ago when seven different agencies were found at work on plans involving the same basic problem.

Population data regarding the United States are also piling up at an amazing rate. The operation of the Selective Service System and the surveys of the War Manpower Commission have produced quantities of material regarding all phases of social relationship. At the same time there is evidence of an interest in processing such material scientifically. In the immigration service experts have been retained to go through a mass of records accumulated over the years to see what scientific use can be made of it. Changes of technique are being studied in the Census Bureau.

This concentration of effort in the field of population has provided opportunities for testing out methods on a large scale. Modifications and improvements are already reported. Some of the measuring devices have proved unnecessarily refined and meticulous; they are being modified along lines which make them more practical, better adjusted to specific questions under consideration.

A second field of scholarly concentration is economic control; Equipping and feeding so large an armed force, guarding civilian requirements, extending relief and rehabilitation to liberated peoples, providing transportation for men and supplies for a global war, called for conversion, control, rationing, and redistribution on a scale entirely unfamiliar to this free and easy, undisci-

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[1] See Robert L. Schuyler, "War and Historiography," *antea*, pp. 342–351; note his reference to Curti's views on the effect of wars on scholarship, pp. 350–351.

[2] I am indebted to my colleague, Dr. Donald Young, Washington representative of the Social Science Research Council, for information regarding research at Washington.

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plined nation Price control and the fight against inflation made necessary additional studies on a large scale In fact the whole economic system of the United States has been the subject of restudy particularly to discover the limits of adjustment and redirection necessary and possible to meet the needs of the crisis.

One result has been economic research and experimentation with all the power and money of the government behind the effort Never has such an opportunity been presented for controlled experiment in the economy of the United States The possibilities of studying some of these phenomena have not been confined to government; private research enterprise has been stimulated Business groups have organized a committee on economic development with a research staff to operate in this field independently of government.

A third field is that of attitudes, of discovering and measuring public opinion In mobilizing the armed services and in organizing selective service on so large a scale, much more had to be known about basic American psychology In the Army and among the civilian population there must be constant study of morale, of attitudes of the soldiers, of their families and of civilians in general Search must be made of the best ways to provide profitable diversions, to improve morale, to counteract vicious tendencies and to relieve group tensions

The Office of War Information undertook to investigate public opinion by polling and intensive interview techniques, but their appropriations have been whittled down to a point where much has had to be curtailed Within the Army itself intensive study of troop attitudes has been made by the Research Branch of the Morale Service Division under Major General Frederick Osborn There is constant study to solve or to anticipate difficult questions, to find out how training features are succeeding, to discover whether certain devices like educational films are effective. Military and civilian personnel are continually at work perfecting sampling, interview, and analytical techniques.

These efforts point to substantial advances After the last war there was much progress made in the study of intelligence and the process of achievement Now it looks as though similar success might be had in socio-psychological research in the field of public opinion and attitudes.

This discussion not only illustrates certain definite achievements in the progress of social science research but it also points out a step of even greater significance. Such opportunities, if effectively followed up in the post-war period, should do much to advance progress toward a more adequate and better integrated social science This province of learning is still a novelty in the world of scholarship and much hampered in its growth by handicaps often unwittingly bestowed upon it by its sponsors

When social science began to be defined, its creators were thinking in terms of concepts analogous to those in the natural sciences Certain patterns and devices much used in the physical sciences were adopted. Efforts were made to produce formulae and to derive laws governing society similar to those used in astronomy and physics Such formulations would be so neat and logical and would seem to make valid the term "science"! Though the various attempts were scarcely successful, the obsession with such a physical science apparatus has remained to divert and hinder

Better adapted to the varied and often unclassifiable data which the human organisms present to social science is a second series of analogies Biological science, devoted to the study of quantities of erratically behaving living organisms guided by nervous systems of varying degrees of complexity, offers more satisfying techniques. They include controlled and repetitive studies such as may be arranged for generations among colonies of organisms such as rats and fruit flies Such biological methods are better adapted to the data of social science but they too are misleading and delusive Human beings as data are usually uncontrollable for experimental purposes, their number is huge and so widely scattered as to be impossible to observe by a sufficiently large and co-operative corps of technicians. Also social scientists themselves are part of their own data, they are human and cannot stand off and observe objectively and without bias phenomena of which they are a part[3]

One of the basic needs of social science, therefore, is the development of its own techniques, independent of physical or biological science analogies. This means procedures better adapted to dealing with large masses of confused and variable data. Much larger numbers of observers are needed trained in co-operative observation in widely separated locales. Methods must be devised better suited to cope with the hardest of all problems, problems not so apparent in the analogous sciences, problems arising from the fact that the basic data of the social sciences are the behavior patterns of human beings, which exhibit that variety conditioned by the unique nervous organization known as the human imagination

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[3] Julian Huxley, "Science, Natural and Social," *Scientific Monthly* 50: 5-17, 1940.

The emerging social science is handicapped not only by confusing analogies but also by other historic conditions of its evolution It is not generally considered a discipline in itself. Historians, political scientists, economists, anthropologists, geographers, sociologists, social psychologists, and statisticians, members of university departments bearing those names, are all included under the rubric Most social scientists therefore have been trained in one of these subjects and have continued to do research in it and to teach its subject matter, often with little or no thought of the wider implications of broader social science and its experimental and philosophical apparatus.

Unfortunately there has been too little progress in throwing off the handicaps of physical or biological science analogies or in forming more coherent groups of social scientists freed from their hereditary departmentalization Now it may be possible that these unusual war experiences will act to urge forward the slow steps of progress A large number of social scientists of the different disciplines have been working together in government service on common problems. They have been at work in accumulating masses of data which they cannot hope to exhaust. Likewise they have been discovering the limits of their ways of working and have been contriving new ones When the war ends they should be on the crest of a wave of creative work But then will come the test. Can this experience be capitalized or will it be wasted and dissipated? Much depends upon the process of demobilization, and even in the midst of war it is the responsibility of those who can exert any influence over the process to be taking thought.

In the first place the war effort is accumulating great masses of data such as those in the fields cited above When the war comes to an end there will be a rapid demobilization of bureaus and offices. Some agencies will fold up, and in many instances, if care is not taken, records will be destroyed or put away in such fashion as to become lost. Social scientists can save much of this if they seek to impress government agencies with a sense of its value and aid the Archivist of the United States in his efforts to salvage it. Even more important is the use of these data. This question is joined with the general one of personnel demobilization.

When the war is over the bulk of the social scientists in Washington may be looking homeward Many will no longer be needed, more will have been waiting impatiently for the opportunity to depart All will find some strain in readjustment Some will have become conditioned to office work and when they return to teaching will find it necessary to relearn habits of the old familiar research and teaching combination More of a problem will be presented by those who have become accustomed to function as administrators rather than as research men and to enjoy the comfortable competence of high salaries To throw off these administrative habits, to come back to lower salary brackets, will be difficult Also institutions will have become accustomed to the ways of their substitutes, new vested interests will have been created, and there may be clashes Those returning will have some difficulty, in many instances, in settling down to old routines

At the end of the conflict likewise there will be a shortage of younger men in the universities, because so few have been trained in these last few years, in a sense a generation of graduate students has been lost This means that more of the routine will have to be carried on by older men, and consequently resumption of research may be further retarded Finally, many of those who have been away may be deflected into business or administration and may not want to return unless new and attractive conditions for carrying on their research are provided

Here is where research planning may help Faculty committees, learned societies, councils, and foundations may well be making plans to prevent loss of momentum They may seek means to encourage those whom they wish to return, so that they may go on with their new work and their new enthusiasm, and exploit to the full the data which they have been using Provision for research time, credit, and funds will be more than ever essential. Closely connected with such problems is another which ought to be considered by the same agencies. A number of social scientists will remain with government. Means should be studied to maintain effective co-operative relations between them and their fellows in the universities and in other, privately financed research agencies.

If this be done, not only will energy be conserved but advance will be made in the new methods which are under experiment. Probably the most effective of these techniques are those of sampling and statistical analysis, those concerned with isolating as completely as possible certain types of behavior and subjecting them to repetitive study, those used in capturing and recording human experiences Much is being learned because the emergency has called forth such large co-operative efforts in studying great masses of data under government aegis When the war is over, it is certain that most of these concentrations of scientists will be dispersed They will return to their smaller circles and narrower horizons Can similar co-operative efforts be organized to keep these advances moving? Can private endowment do this or must it be left to government with all the questions which government research raises?

All this presents a thought-provoking problem. Will demobilization inevitably cause dissipation of energy, loss of momentum, return to small individual effect, to the enervating relaxation which comes with the releasing of tension? Is the pessimism which is stimulated by some of the possible answers to the question justified or can we look to a more hopeful outcome? The answer, whatever it may be, will make an interesting contribution to that most intriguing problem of human dynamics Can long-time behavior trends or recurring phenomena seemingly demonstrated by repetitive experience be arrested or diverted by taking thought?

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CONTENTS

Entropy . 365
Karl K. Darrow, Bell Telephone Laboratories.

The Correspondence between Constantine Samuel Rafinesque and Thomas Jefferson 368
Edwin M Betts, University of Virginia

The Philosophical Meaning of the Copernican Revolution 381
Philipp Frank, Harvard University

French Refugees of 1793 in Pennsylvania 387
Elsie Murray, Tioga Point Museum, Athens, Pa

Ben Franklin's Mortgage on the Daniel Boone Farm 394
J Bennett Nolan, Lieutenant Commander, U. S C G R (T)

Wynicaco—A Choptank Indian Chief 398
C A Weslager, The Archaeological Society of Delaware

An Inexhaustible Source of Linguistic Knowledge 403
Arthème Dutilly, Catholic University of America

The Earliest Account of the Association of Human Artifacts with Fossil Mammals in North America . 407
M. F Ashley Montagu and C Bernard Peterson, Hahnemann Medical College and Hospital, Philadelphia, and The Academy of Natural Sciences of Philadelphia

The Novel of Ninus and Semiramis 420
Doro Levi, Institute for Advanced Study, Princeton, N J

The Time Factor in Chromatophore Responses . 429
G. H Parker, Harvard University

Physiological Time 435
P Lecomte du Noüy, L'École des Hautes Études, University of Paris

Studies on the Army-Ant Behavior Pattern—Nomadism in the Swarm-Raider *Eciton burchelli* 438
T C. Schneirla, American Museum of Natural History.

ENTROPY

KARL K. DARROW

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(A slightly amplified version of a paper read April 24, 1943)

It would doubtless be fitting for me to begin by stating a relation between entropy and Thomas Jefferson, but I cannot find any, for Jefferson died about a score of years before the concept of entropy was invented. This was probably a piece of good fortune for him, since according to Dr. Becker's speech of Thursday evening he was acquainted with all the ideas of his time—a large order even for the eighteenth century, it seemed to me—and he would probably have had quite a struggle with this one. I presume that he would have mastered it, and I am sure that he would have been too wise to promise to speak about it in less than twenty minutes, but since I was not so wise, I shall have to go ahead.

The purpose of the concept of entropy is to interpret—and notice that I do not say "explain," I say "interpret"—the purpose of the concept of entropy is to *interpret* the fact that certain processes of Nature always go one way and never the other. These are not recondite processes, some of them are only too familiar. A human being goes from the state of being a baby to the state of being an old person, and never in the opposite direction—except in *Faust*, and there it takes the devil to make the difference. A suit of clothes wears out with use, it never grows fresher. Humpty-Dumpty falls off the wall, and all the king's horses and all the king's men can't put him together again. A house which catches fire is converted to ashes, and nothing comes out of the ashes unless it be a phoenix—and even the phoenix is not authenticated. Hydrogen and oxygen mixed in the right proportions turn into water with only a trivial inducement, but to turn water back into hydrogen and oxygen is a major operation.

To take a simpler illustration, let us think of a bowl of water, or better, of something more interesting nowadays—a cup of coffee. You stir it and remove your spoon, and for a little while it is swishing and thrashing around in the cup, but after that little while it settles down to perfect tranquillity. It never goes back of itself from the state of tranquillity to the state of thrashing about in the cup—and when I say "never," in the words of the forgotten song, "I don't mean hardly ever." This is something which everybody knows. Books abound in statements that every schoolboy knows this, and every schoolboy knows that, and everybody knows some other thing. Usually such a statement is not true, but this time it is—at least for everyone above the age of eight, and below that age I suppose one would ascribe such an event to a gremlin.

Now the idea about entropy is, that in each of these "one-way-street" processes there is a quantity called entropy which increases while the process is going on, and which is forbidden by Nature ever to decrease. If the process were to go backward, this something would have to decrease, but that is prohibited—and that settles it.

Thus far I have, of course, said next to nothing. To say anything of importance it is necessary to say something definite and numerical. This clearly excludes all the complicated cases such as those of the aging man, the deteriorating suit of clothes, and the burning house. The case of the cup of coffee is just within the scope of the mathematical theory, but I will take a simpler one, the simplest one of all: the case of a gas in a box.

Here is the box (rectangle on the blackboard) and here is the gas (circles depicting the atoms). I put the circles only in one-half of the box. You at once see that there is something wrong with this, and of course there is. I have put in nothing to indicate any partition between the half of the box which contains the gas and the half which is empty. Suppose I say that there *is* no partition, then you feel that either my drawing is ridiculous, or else it depicts a state of affairs which exists only for an imperceptible moment after a partition which was formerly there—it might have been a soap-film, for instance—has vanished. The moment the partition vanishes, the gas sets forth to fill the whole box evenly. This is precisely one of these "one-way-street processes." The gas goes of itself from the condition of filling half the box to the condition of filling the whole of the box, and it never goes back. In more technical language the gas goes of itself from a state of non-uniform distribution (in the space open to it) into the state of uniform distribution, and it never goes of itself from the state of uniform distribution into any state of non-uniform distribution.

What we are to call entropy must then be bigger for the state of uniform distribution, than for any state of non-uniform distribution. But this is not the only condition imposed upon entropy; if it were, we could fulfill it in any number of ways. There are several other conditions imposed on entropy by the science of thermodynamics; I mention one, to the effect that the entropy must be in proportion to the logarithm of the volume of the gas, and another, to the effect that the entropy of two identical gases must be twice the entropy of either by itself. There are yet others. It may seem surprising that we can find a mathematical quantity which fulfills all of these conditions, and it is certainly surprising that we have two ways almost entirely different for finding such a quantity. These are the ways of the "old statistics" and the "new statistics."

To illustrate the method of the old (or classical, or Boltzmann) statistics, I now simplify the gas still further, by reducing it to just two molecules which I mark A and B. I divide the box into two halves by an imaginary plane—*not* a physical partition—and call the two halves L and R. Now there are two conceivable non-uniform distributions: both balls in L, and both balls in R. There is one conceivable uniform distribution: one ball in L and the other ball in R. Notice, however, this important detail. The uniform distribution can be realized in two ways: molecule A in L and molecule B in R—molecule A in R and molecule B in L. This double possibility does not exist for either of the non-uniform distributions. The uniform distribution is outstanding over either of the non-uniform ones, in respect of the number of ways in which it can be realized. If I were to say that the number of ways in which a distribution can be realized is the entropy thereof, then my entropy would be bigger for the uniform distribution than for any other. To be in harmony with thermodynamics, I must, however, say that the entropy is in proportion to the *logarithm* of the number of ways in which the distribution can be realized, and then it is still true that the entropy is bigger for the uniform distribution than for any other.

If the same sort of reasoning is applied to the distribution of the molecules in *velocity*, then the mathematical conditions are somewhat changed, and it turns out that among the possible distributions the one which can be realized in the greatest number of different ways is the famous Maxwell-Boltzmann distribution. This has been attested by experiment for the molecules of gases, for the electrons emerging from hot filaments, and for neutrons wandering about in paraffin or water. The old statistics chooses the uniform distribution in space and the Maxwell-Boltzmann distribution in velocity as having the greatest value of what it calls entropy—and so also, by the way, does the new statistics. Nature chooses these two as being the termini of the one-way-street processes, the distributions toward which a gas always tends and from which of itself it never departs. So, a one-way-street process is now successfully correlated with a rise of entropy. But if you ask of the theory *why* the entropy should always rise and never fall, you are likely to get either a very cloudy answer, or else a forthright disclaimer of responsibility for any answer.

The mathematical operation just mentioned can be visualized as the act of counting the different ways in which distinguishable balls can be assorted in distinguishable baskets, the number of balls in each basket being chosen in advance, and two ways being counted as different unless it can be said of every basket that it contains just the same balls in both cases. The balls stand for the molecules and the baskets stand for the compartments such as L and R of my drawing, into which the volume occupied by the gas is mentally divided. This is the method of the old statistics, and it involves the assumption that the molecules are distinguishable even when they are all of the same gas, which seems absurd. In the method of the new statistics the same operation occurs, but here the balls stand for the compartments and the cells stand for what I may call the "populations"—the compartments containing no molecule go into basket 0, the compartments containing one molecule go into basket 1, and so forth. A compartmentation of the volume in two stages—bigger compartments subdivided into smaller ones—is required, and there are other complications of a mathematical nature which make the new statistics harder to grasp and manage than the old. However, the new theory allows us to regard the molecules of a single gas as indistinguishable, and it makes the entropy of two identical gases twice the entropy of either taken by itself, which the old statistics does not do except when distorted

Now I will close with a remarkable result which follows from the newer statistics directly, from the older theory only by distorting that theory in a manner hard or perhaps impossible to justify

Let the gas in the box be cooled down as far as it is possible to go It starts with a definite value of entropy, for the theory has given it one As it cools down, heat flows out of it, and its entropy goes down We are able to measure the decline of its entropy, for thermodynamics says that as each small quota of heat flows out, the entropy of the gas declines by just the amount of the outflowing heat, divided by the (absolute) temperature which the gas has at the moment As the cooling continues, the gas may liquefy, then the liquid may cool down further, then solidify, then the solid will continue to cool Always we measure the outflow of heat and we calculate the loss of entropy Finally the solid is cooled down to as close to the absolute zero as it is possible to go—and with modern technique this is so close that we can extrapolate the rest of the way to the absolute zero with a good deal of confidence. Now the result is, that the amount of entropy lost during the whole of this cooling is just equal to the amount which, according to the theory, the gas started out with The entropy of the solid at the absolute zero is therefore, according to this combination of theory and experiment, *zero*

What shall we take this as meaning? Well, it is to be noted that the solidified gas is a *crystal*, which is the most regular and *orderly* arrangement of molecules that exists in Nature. So long as the crystal is warm, there is still the disorder due to thermal agitation, but the nearer it falls to the absolute zero, the more closely this form of disorder approaches to its absolute minimum The testimony of the data is that in its most orderly form, matter has for its entropy the value *zero*

I have now made two statements about entropy first, that it always increases and never decreases, at least not without intervention diabolical or human, and second, that for matter in its most orderly form it has its minimum value of *zero* I combine these into a single statement *Entropy is a measure of disorder, and disorder always tends of itself to increase.*

The merit of this statement is that it sounds reasonable on its face We all know that the passage from order to disorder is one of those one-way-street processes of which I have been speaking When we return to our hotel this evening, we shall find our rooms all nicely put in order, but we shall not assume for one moment that they put themselves that way we shall infer that someone intervened, though we shall not have to assume that it was the devil Another merit is, that it is a short, curt, snappy statement There is, of course, a serious difficulty about snappy statements. They cannot be made to cover all cases without redefining their terms in very elaborate ways, and when this has been done, the combination of statement *plus* redefinition of terms is no longer snappy, but is likely to be quite the reverse Such is very much the case with my statement about entropy, but as a short statement, easy to remember, it has its good points, and I should like to leave it in your memories. Now it occurs to me how I can bring Thomas Jefferson into this story Another thing which Dr Becker said was that Jefferson did not want a government to do very much About all he wanted it to do was to maintain order. In other words, he wanted government to keep the entropy down. Not very much, indeed! It would be too much even for a dictator

THE CORRESPONDENCE BETWEEN CONSTANTINE SAMUEL RAFINESQUE AND THOMAS JEFFERSON

EDWIN M. BETTS
University of Virginia

SEPTEMBER 18, 1940, marked the centenary of the death of America's most versatile and most tragic naturalist—Constantine Samuel Rafinesque During his relatively short life he ran the whole gamut of sorrows But despite the sorrows and physical pains that plagued him throughout his life, he gave to science many contributions, some of value, others of interest but of no great importance

April 13, 1943, marked the bicentenary of the birth of Thomas Jefferson, America's most versatile statesman and an enthusiastic naturalist He died on July 4, 1826. His influence affected almost every phase of American culture during his long life It continues to permeate it today. His biography is too well known to require comment here The correspondence between Jefferson and Rafinesque, which is here published for the first time, shows especially Jefferson's interest in science and scientists, and the progress of building the University of Virginia It gives us a new insight into several aspects of Rafinesque's life and work

Rafinesque was born in Turkey, October 22, 1783, of French-German descent. He came to the United States in the spring of 1802, landing at the port of Philadelphia. He was fascinated by the new flora surrounding him and immediately began naming supposedly new genera and species While in business in Philadelphia he made many trips into the surrounding country, collecting and naming new plants.

In 1804 he resigned his clerkship and made extended botanical tours into Maryland, Virginia, and the District of Columbia While in Washington he was introduced to Jefferson through the courtesy of General Henry Dearborn, Secretary of War in Jefferson's Cabinet. Jefferson immediately saw in Rafinesque a young man of extraordinary talents, with an unusual knowledge of plants. Each must have fascinated the other, for they had many common interests. Both were intense lovers of nature and all her creations, and their versatility embraced all things. Jefferson differed in one fundamental way from Rafinesque: he paid minute attention to details, while the other had no time for them Rafinesque was a traveler and must move on

A few months after meeting Jefferson, Rafinesque left the United States for Italy and Sicily, where he lived for ten years. There he traveled, explored, and wrote many papers on his discoveries. He returned to the United States in 1815, and in the fall of 1[illegible] accepted a professorship in Transylvania University, at Lexington, Kentucky. This university had been formed by combining two earlier schools, Transylvania Seminary and Kentucky Academy. During Rafinesque's connection with the university, the Reverend Horace Holley, was president Rafinesque left Transylvania University in 1826, and went to Philadelphia where he lived the remainder of his life He died, in poverty, in a garret in 1840 A number of his friends prevented his body from being sold to a medical school and gave it a decent burial. Today his body lies in a grave on the campus of Transylvania University

The correspondence between Jefferson and Rafinesque covers two periods of Rafinesque's life: the first, in the year 1804, just before he sailed for Italy; the second, during his professorship at Transylvania University.

The only meeting between Rafinesque and Jefferson took place in the early part of the summer of 1804. Jefferson was serving his first term as President. The meeting was evidently cordial and enthusiastic, for Rafinesque called again at the White House on July 23, a few days after his first visit. Finding that Jefferson had gone to *Monticello*, his home at Charlottesville, Virginia, for his usual summer visit, he wrote the following letter to him.

SIR,[1]

An excursion of a few days, I took into Virginia the day after having had the honor of being pre-

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[1] Letter in Tucker-Coleman Collection in Department of Research and Record, Colonial Williamsburg, Inc.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO 5, MAY, 1944

sented to you, prevented me from calling again upon you before this day, when I heard you had departed for Monticello I therefore take the liberty of adressing you this Letter for the purpose of conveying you, at least, a small parcell of the seeds of the *Jeffersonia binata*,[2] I intended to have presented you with, at my second interview, together with one dry *capsul* of the plant for a specimen of its *fruit*

Wishing they may grow with you, I remain with the Sincerest esteem

Sir
Your most obed^{t} Serv^{t}
C S Rafinesque
T S V. P[3]

Washington 23rd July 1804

The *Jeffersonia binata* was called formerly *Podophyllum diphyllum* by Linneus and was quite lately named J. bartonia by Michaux (in his *flora borealis-Americana*) but Dr Barton's name being the best suited is to be retained

I am collecting materials and informations for a compleat *flora* of the middle atlantic States, my interview with you having been so short, I have been prevented from asking you if it was in your power to add any of either to my already extensive stock of them, anything new in that way and in whatever relates in the least to native plants would be gratefully received and acknowledged by Y^{r}. anew Ob^{t} S^{t}.

C S Rafinesque
Care Mr L Tarascon
Philadelphia

Jefferson replied[4] to Rafinesque's letter sometime between July 28, when he received it, and November 27, when Rafinesque again wrote him

[Philadelphia] Nov 27, 1804[5]

Sir

Having left Washington City soon after sending you a few seeds of the *Jeffersonia*, I did not receive the Letter you wrote me in answer, until having heard there was a Letter for me at the Post office of that City, I made application for it and got it at my return from a journey to the Blue-mountains of Pennsylvania and New-Jersey

It is with regret I perceive, that pursuits of an opposite Nature to Botany and Natural History those ever pleasing Sciences for an enlightened Soul, have weakened your familiarity with them, but am extremely thankful for your offer of recommending me to good Botanical Counsellors whenever I shall come to your part of the Country, it is likely I shall visit Virginia again next year, and shall then make up of your kind offer if I have the honor of seeing you again either at Washington or Monticello

I am going to send this winter a *Florula Columbica*[6] to Dr Mitchill for his Medical repository,[7] it will contain a catalogue of nearly 800 plants I have found in the Territory or District of Columbia both in Virginia & Maryland and a short Description or rather Car Spec. of several New plants

The Western parts of the U S are as yet very little known I intend to go and explore part of Kentucky & Ohio next Spring I wish I could go still farther and across the Mississipi into the unexplored region of Louisiana, but it is a mere impossibility in my private Capacity to visit such unsettled and as yet very wild Country I wonder the American Gover^{t} have not sent some Botanist there along with Mess^{r} Lewis & Hunter, a Country containing perhaps a great number of the Valuable Vegetables of Mexico is worth and deserves highly to be fully explored, If it ever seems worthwhile to you, to send a Botanist in Company with the parties you propose to make visit the Akansas or other Rivers, I can not forbear Mentioning that I would think myself highly honored with the choice of in being selected to make known the Veget^{n} and Animal riches of such a New Country and would think that Glory fully adequate to compensate the dangers and difficulties to encounter

I remain respectfully Sir
Y^{r} most Obed^{t} Serv^{t}
C S Rafinesque

His Exc^{y} Th Jefferson

Jefferson replied to Rafinesque's letter of November 27 on December 15

Washington December 15 1804[8]

Sir

I have to acknoledge the receipt of your favor of Nov 27 I have it in contemplation to send in the ensuing spring a party up the Red river to it's source, thence to the head of the Arkansas and down it to it's mouth, principally to ascertain the geography of these rivers and incidentally only to know the production of the country. but it depends on the legislature whether they will authorize the mission and provide for it's expense if they do it will be on that very moderate scale on which our revenues are always dispensed Mr Hunter is engaged to go with the party. his forte is mineralogy and chemistry, and he is contented to go merely to satisfy his taste in these lines certainly I should be happy to add your botanical talents to the party but that is not in my power to propose any berth worthy your acceptance expenses only with little other compensation are expected by the members of the party, who are chiefly induced to undertake the journey for the gratification only of their curiosity to you your time and labors have far other value. the party will consist of an officer and from 12 to 20 men and will probably be accompanied by a few Indians, as guides and hunters.

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[2] Now called *Jeffersonia diphylla*.

[3] *Tournez s'il vous plait* (please turn over).

[4] This letter has not been found.

[5] Letter in Tucker-Coleman Collection in Department of Research and Record, Colonial Williamsburg, Inc.

[6] *Cf* Elbert L. Little, Jr. A note on Rafinesque's Florula Columbica. *Proc Biol Soc Washington* 56 57-65, 1943

[7] *The Medical Repository* (Samuel Mitchill, editor), 1797-1824 The magazine published original essays relative to chemistry, medicine, natural history, agriculture, geography, and the arts. It also carried reviews of American publications of the above subjects.

[8] Letter in *Jefferson Papers*, Library of Congress.

Accept my salutations and best wishes
Th Jefferson

Rafinesque probably never saw this letter. He had just sailed from the United States for Italy, to be away ten years If he had received the letter before his departure, it no doubt would have changed the whole course and tenor of his life Thomas Clifford, Rafinesque's constant friend, replied to Jefferson's letter It is inserted here to complete the first period of the correspondence

Philadelphia 18th. Dec 1804 [9]
Th Jefferson, Esq
Sir

In consequence of Mr C S Rafinesque's desire I took the liberty of opening the letter with which you honored him and presume from the purport of it that you may still wish to engage a Botanist to accompany the expedition up the Red River, I am induced to trouble you with the information that Mr Rafinesque sailed a few days ago per Leghorn, I have no doubt he will much regret the opportunity thus lost of exploring so extended field of Botanical research and consider himself much obliged for your intention of employing him as one of the party

Yours very respectfully
Thomas Clifford

While Rafinesque was spending ten years in lovely Italy and Sicily, Jefferson had completed his second term as President of the United States and had retired to his *Monticello* In January, 1809, he wrote to his friend, James Monroe. "Five weeks more will relieve me from a drudgery to which I am no longer equal, and restore me to a scene of tranquillity, amidst my family and friends, more congenial to my age and natural inclinations." In his retirement at *Monticello*, Jefferson wrote letters, farmed, enjoyed his garden, kept up with the happenings in the young Republic, and tried to recover his estates from the neglect caused by careless overseers during his long public service

For many years the idea of a university for the State of Virginia had been growing in Jefferson's mind By 1817 it had become the passion of his life. Rafinesque in the meantime had returned to the United States in 1815, and in the fall of 1819 had accepted a professorship in Transylvania University

In 1819 Central College, which had been chartered in 1817, but had never opened its doors to students, became the University of Virginia. Rafinesque, hearing of the new university, with Jefferson at its head, probably thought that this would be an ideal place to bring his many-sided researches to maturity. He applied to Jefferson many times for an appointment to a professorship in the university. The letters of the second period deal with these applications and incidentally show many interesting aspects of Rafinesque's life and character

Transylvania University
Lexington K^{y} 16th Sept^{r}. 1819 [10]
Hon^{ble} Thomas Jefferson
Monticello
Respected Sir'

I hope that no apology will be needful, for taking the liberty of adressing you in the character of one of the Trustees[11] of the Central University of Virginia. If any was requisite I would endeavour to bring to your recollection, the interview I had with you at Washington City in 1804, when I was introduced to you by Gen^{l}. Dearborn & the kind invitation you proferred to visit you at Monticello,[12] which I regret it was never in my power to do

The motive which now prompts me to write you, is to let you know that having heard that the Central University of Virginia, will soon go into operation, on the wise & liberal plan which you have suggested, I wish to be considered as a candidate for the professorship most congenial to my pursuits, & beg you accordingly to lay before the board of Trustees, the annexed Letter, which states such a desire.

It may be proper, while I offer myself for this appointment, to explain what are my qualifications & motives. This I mean to do by the following private explanations, of which you are at liberty to make the needful use, & to communicate any part thereof, or the whole, to any other Member of the Board.

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[9] Letter in *Jefferson Papers*, Library of Congress.

[10] Letter in *Jefferson Papers*, University of Virginia.

[11] Jefferson was Rector of the Board of Visitors of the University.

[12] R. E. Call (*The Life and Writings of Rafinesque* 48, 1895) says that Rafinesque visited Jefferson at *Monticello* The present statement shows that Rafinesque did not visit at *Monticello*.

I was born in Europe, my father was a frenchman, my mother a german From my earliest youth I have felt an innate taste for natural history & natural Sciences I came at an early age in the U. St of America. I lived since many years in Italy & Sicily, and I returned to America in 1815 with the intention of residing altogether in the U St I have travelled in them (often on foot) from Vermont to Virginia & from Connecticut to Illinois. I have discovered an immense number of new Plants, Fishes, Shells, fossils etc and even some new Quadrupeds¹ Some of my American & european discoveries are published, many are yet in manuscript I have published several Works & many tracts in the English, french, italian and latin languages. My flora of Louisiana[13] was sent you by mail. You will find many of my late Tracts in the American Journal of Science,[14] the American Monthly Magazine[15] & the Western Review [16] I have been elected member of several learned Societies, and if it should be necessary to exhibit Certificates of my Abilities, I could produce those of my worthy friends Dewitt Clinton,[17] Dr Sam L Mitchill,[18] Zaccheus Collins[19] and others

I am now well situated in this town, but some un towards Circumstances in this University, might induce me to prefer a more eligible situation elsewhere, & nearer from the Atlantic Shores

If in the infancy of your University, it might become needful or desirable to acumulate several departments on one professor, as you have already united the different branches of Natural history in one professorship, I might undertake to teach at the same time the following branches, (which I am fully competent to teach) provided a small additional compensation might be allowed they are the french & italian languages, materia medica, Natural philosophy, Geometry, Map drawing, Natural history drawing, Political Economy &c

I have an extensive & rich herbarium of American plants, a small library &c, which would be deposited in the University I might be willing to set apart annually one fourth or one third of my emoluments for the purchase of books, to increase the library of the Univʸ

I am imperfectly acquainted as yet with the new arrangements & dispositions taken by your board, except what has been published in the Newspapers. I don't know when & how the Univʸ is to be fully organized, nor what allowances will be made I shall merely add that my expectations are moderate, but my zeal very great It would be gratifying, if you could let me know at your leasure how the Univʸ progresses, adding any needful explanations, & asking freely any additional details from me

I have the honor to be respectfully—Sir
Your Obedᵗ Sᵗ
C S RAFINESQUE

The following letter was enclosed with the one just presented

Lexington Kʸ 16ᵗʰ Septʳ 1819

To the TRUSTEES OF THE CENTRAL UNIVERSITY OF VIRGINIA

GENTLEMEN—

I beg leave to offer myself as a Candidate for the Professorship of Natural History (in all its branches, such as Botany, Zoology, Mineralogy & Geology) in your University, whenever such an appointment shall be made

I am respectfully
Gentlemen
Your most humbe Servᵗ
C S RAFINESQUE

{ Professor of Botany & Natural History in the Transylvania University, &c

{ Member of the Royal Institute of Naples, the Italian Society of Arts & Sciences, the Literary and philosophical Society of New York, the historical Society of New York, the Lyceum of Natural history of New York, the Academy of Natural Sciences of Philadelphia &c

{ Author of the Analysis of Nature,[20] the New Genera of Sicilian animals & Plants,[21] the Mirror of Sciences,[22] the flora of Louisiana &c.

Monticello Nov 7, 19 [23]

SIR

A long and severe illness, from which I am but now recovering must apologize for this late acknolegement of your letter of Sep 16. received on the 6ᵗʰ of Oct. the Visitors of the University having determined to employ all their funds in providing for the accomodation of Professors and students untill these are compleated, there is of course an entire suspension of the appointment of professors. when the University can be opened is quite uncertain, but surely not till the year after the next I will take care to lay your letter[84] before the board in due time, and have no doubt it will command all the consideration which your well known qualifications entitle it to

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[13] *Florula Ludoviciana, or, A Flora of the State of Louisiana.* New York, 1817. This book is listed in the catalogue of Jefferson's library Rafinesque's name appears several other times in Jefferson's catalogue, but never with the title of the work added.

[14] *American Journal of Science* New Haven, 1818-

[15] *American Monthly Magazine and Critical Review* New York, 1817-1819.

[16] *Western Review and Miscellaneous Magazine* Lexington, Kentucky, 1819-1821.

[17] De Witt Clinton (1769-1828), American statesman New York.

[18] Samuel Latham Mitchill (1764-1831), American physician and naturalist New York.

[19] Zaccheus Collins (1764-1831), American naturalist. Philadelphia.

[20] *Analyse de la nature ou tableau de l'univers et des corps organisés* Palermo, 1815.

[21] *Caratteri di alcuni nuovi generi e nuove specie di animali e piante della Sicilia con varie osservazioni sopra i medesimi* Palermo, 1810

[22] *Specchio delle scienze &c* First volume, 1814 Modeled upon Dr Mitchill's *Medical Repository*

[23] Letter in *Jefferson Papers*, University of Virginia.

Accept my salutations of esteem & respect
Th Jefferson

Mr Raffinesque

Lexington Ky 18th Octr. 1820[85]

Honble Th Jefferson
late Prt of the U St
Respected Sir

I lately took the liberty to address you three Letters on American or rather Alleghanee Antiquities, which were published in the Kentucky Reporter[86]

I now transmit you Prospectus of a new literary undertaking,[87] with some details of its future contents, (in a Number of the Reporter) I will be the principal Editor of this Journal, to which many eminent individuals will contribute We solicit your patronage, and hope to deserve it

I sent you the first Number of my Annals of Nature[88] last Spring, I hope that it was duly received

If you should answer me, please let me know something about the prospects of the Central University of Virginia

Believe me Sir! respectfully and Sincerely
Your St & Wellwisher
Profr C S Rafinesque

PS Having observed last Spring the beautiful Plant called *Jeffersonia binata*, I have made two discoveries relating to it 1. That the flowers smell like Jonquil 2 That the Stamina are apposed to the petals, and the plant belongs therefore to the natural order of Berberiales

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Monticello Nov 6. [1820][89]

Sir

Your favor of Oct 18 was received yesterday the three letters on Alleganian antiquities have not yet come to hand for the 1st nr. of your annals of nature I have still to thank you. they have not been before acknoleged because the inexorable laws of old age and ill health have withdrawn me from the labors of the writing table to which I am no longer competent writing is become slow, laborious and painful the Western Minerva will doubtless be valuable, and give useful exercise to the talents of our Western brethren, whom I rejoice to see advancing in the career of science.

Our University, after which you enquire, will have all it's buildings compleated by this time twelvemonth but to accomplish this we have contracted a debt which if not taken off our hands by our legislature, will require for it's redemption several years of our funds, and so long leave us without the means of employing professors so that the epoch of opening it hangs on that dilemma, as does the question whether I shall live to see it[90] with sincere prayers for the progress of science in every part of our country I tender you my friendly and respectful salutations.

Th Jefferson

Mr Rafinesque

Lexington Ky 25th Jany 1821[91]

He Th Jefferson
Monticello
Respected Sir

I have delayed answering your last favor until I could send you my *Ichthyology of the Ohio*,[92] and the *Western Minerva*. The former I have now the pleasure to forward you, and shall be glad to know your opinion on it But I cannot send you the *Western Minerva*, although the first number *is printed*, because this Journal is not to be published *at present* It has been condamned before its appearance (upon some proof sheets) by a new kind of Western Literary Inquisition and Censorship, and forbidden to be published, to which we have been compelled to assent for peace sake *C'est une cabale nouvelle del ignorance contre les lumieres* The principal motives stated in the verbal decree of this new Inquisition, were, that the Journal was too learned, that it dared to inculcate political and moral Wisdom, to surmise that the Sun does not stand still and has an orbit and that the Earth therefore performs a spiral course through Space, to teach Agricultural truths, to employ mystification against ignorance and folly &c, &c. You will perhaps hardly believe that this could happen in the U St but it is a fact, and although we had 2 or 300 Subscribers, we must suppress the work, and are even forbidden or rather prevented to publish the fact in the newspapers If I can recover some proof-sheets, I will send them to you they will be a literary Curiosity, and you will judge whether the decree was just, timely or even excusable

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[84] There is no record in the Minutes of the Board of Visitors of the university that Rafinesque's application was ever presented

[85] Letter in *Jefferson Papers*, Massachusetts Historical Society

[86] *Kentucky Reporter* Lexington, Kentucky, 1808-1832.

[87] *The Western Minerva or American Annals of Knowledge and Literature*, a Quarterly Journal to be published in Lexington, Kentucky The first number was published in January, 1821 The journal was suppressed and only three copies were saved from this first number See letter, Rafinesque to Jefferson, January 25, 1821

[88] *Annals of Nature* Lexington, 1820.

[89] Letter in *Jefferson Papers*, Massachusetts Historical Society

[90] The University of Virginia was opened for instruction on March 7, 1825 Jefferson died on July 4, 1826.

[91] Letter in *Jefferson Papers*, Massachusetts Historical Society.

[92] *Ichthyologia Ohiensis, or Natural History of the Fishes Inhabiting the River Ohio and its Tributary Streams, Preceded by a Physical Description of the Ohio and its Branches* Lexington, 1820

This is *but one* of the many difficulties which I experience in the prosecution of my labors, but after a momentary despondency, my courage and zeal overcome them

I am however tired of being sequestered in a spot where my labors are but partially appreciated, and I long for a wider field, where I may have an opportunity of enlarging the Sphere of Knowledge without restraint

I have read your Report to the Legislature of Virginia I am sorry to perceive that you do not wish to Organize immediately your University You must be aware that the Professors which are to be called to it, must come from far, some perhaps from Europe (if I am rightly informed) and one or two years, will be requisite for them to prepare themselves, settle their interests and come. It might perhaps be advisable to name immediately your Professors, which might only take possession in due time, if some should refuse the appointment, you would then have time to name others I say so because it is my wish that a prompt decision might take place and in your life time If I was elected in any branch, it would be greatly beneficial to me, even if I was only to take possession in five years and meantime I am prevented by this hope from applying any where else.

I have heard it mentioned in conversation that you meant *perhaps* to send to Europe for all your Professors.[33] I hope that this is not the case, at least for all and in what relates to me, I do not know a single Individual either in the U St or in Europe, who is *at the same time equally acquainted* with Geology, Mineralogy, Meteorology, Zoology, and Botany as I am I am in correspondance with the most distinguished Naturalists & Botanists of both continents, and when it will be needful, extracts from their Letters will show how they value my labors and discoveries. It will be sufficient to name in Europe Dr. Leach[34] the best Zoologist of England, Prof Hooker[35] of Glasgow, the best Scotch Botanist.

W Swainson[36]—the author of Zoological Illustrations
Dr Sealy—of Cork in Ireland
Chevalier Cuvier[37]—of Paris
Prof Decandolle[38] of Geneva, the first European botanist
Prof. Delille[39] of Montpellier
Mr Bory St Vincent,[40] Editor of Annals of Phyl. Science
Prof Gravenhorst[41] of Breslau
M Blainville[42]—Paris, Editor of Journal D'hist. Naturelle
And in the United States, Stephen Elliot[43] of Charleston, Dr Torrey[44] of New York, Dr Mitchill, Gov^{r} Clinton, &c

If the Election of your Professors is still delayed, and you may recommend me meantime for some other literary situation, I hope you will remember me The liberal offer of my Library, Museum and Herbarium, ought to show how zealous I am for Science, even against my interest Whenever I shall have a liberal Salary, I shall not spend it as many of our American Professors have done till now, in giving parties and carousing, but in performing Scientific Travels (in the vacation), publishing important works, purchasing rare books &c

I hope you will excuse whatever may be too personal, and bold in this letter I write under some sharp feelings, and wish you could know me thoroughly. Your discernment will perform the task Believe me Respected Sir, Sincerely Yours

Prof C S Rafinesque

PS. Who are the other Trustees of your University?

Lexington Ky 3^{d} April 1821[45]

Hon^{ble} Th^{s} Jefferson
Monticello

Respected Sir!

I have lately done myself the pleasure to forward you a Copy of my Ichthyologia Ohiensis, and of the Catalogue of our University

I have since seen in the Richmond Enquirer[46] that the Legislature of Virginia have provided for the complement of the buildings of the University of Virginia, and it is expected that the Institution will go into operation on the 1st January next If this is really the case, the appointments of Professors cannot be delayed much longer, and it might be proper for me to renew the application which I formerly made

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[33] Five of the first eight professors of the university came from Europe

[34] William Elford Leach (1790–1836), English naturalist and physician.

[35] Sir William Jackson Hooker (1785–1865), English botanist.

[36] William Swainson (1789–1855), English naturalist.

[37] Georges Léopold Chrétien Frédéric Dagobert Cuvier (1769–1832), French naturalist.

[38] Augustin Pyramus de Candolle (1778–1841), Swiss botanist

[39] Probably Jacques Delille (1738–1813), French poet

[40] Bory de St Vincent (1778–1846), French geologist and naturalist

[41] Johannes Ludwig Cristian Gravenhorst (1777–1857), German naturalist

[42] Henri Marie D de Blainville (1777–1850), French naturalist.

[43] Stephen Elliott (1771–1830), American botanist

[44] John Torrey (1796–1873), American botanist and physician

[45] Letter in *Jefferson Papers*, Massachusetts Historical Society

[46] *Richmond Enquirer.* Richmond, Virginia, 1804–1877.

As I conceive that in such a circumstance, it might be well to give to the Trustees of the Institution a slight Knowledge of my qualifications, as they are probably not acquainted with the extent & variety of my labours, I take the liberty to hand you a Catalogue of my Works, which is the best evidence I can produce of my labours, in my behalf I add also a sketch of the honors conferred on me, by several learned Societies, the names of some of my Scientific Correspondents, some short testimonials of theirs in my favor, and an Account of my Library & Collections

I hope you will lay the whole before the board of Trustees, together with my former application & offer, which I expect may be joined to your kind Recommendation

If any thing else is to be done, I wish I was aprised of it, in order to comply in time

Allow me to conclude that if my application is attended to, I trust to shed some slight fame on the University of Virginia, by my future works, and Discoveries, as I mean to employ part of my Salary in publishing the numerous manuscripts & Drawings, which I have by me

If I knew whether I have any competition and who they are, I might perhaps show by a comparison of their labours with mine, who was the most deserving of notice And at any rate I trust that none could ever exceed me in zeal and industrious researches.

Believe me, Dear & Respected Sir truly
Your Obedt. St & Wellwisher
Prof C S RAFINESQUE

Testimonials
In favor of Profr C S Rafinesque

Profr C S Rafinesque was elected Member of the Royal Institute of Naples in 1814
Of the Italian Academy of Arts & Sciences in 1815
Of the Literary & Philosophical Society of New York in 1816
Of the Academy of Natural Sciences of Philadelphia in 1816
Of the Historical Society of New York in 1817
Of the Lyceum of Natural history of New York in 1817. Being one of the Founders & framers of this Institution
Of the Medical Societies of Lexington and Cincinnati in 1819
Of the American Antiquarian Society in 1820

C S Rafinesque reckons in the number of his friends and Correspondents

In Europe

Chevalier Cuvier of Paris
Mr Bory St. Vincent of the French Academy
Mess Blainville, Noel,[47] Geoffroy,[48] &c of Paris
Prof. DeCandolle of Geneva, the first Botanist of the Continent
Prof Delille of Montpellier
Mess. Vanmons[49] & Drapier[50] of Bruxelles
Mess. Swainson of Liverpool
Dr Leach of the British Museum the best naturalist in England
Prof. Gravenhorst of Breslau
Prof Shultze[51] of Bavaria
Prof. Romer[52] of Zurich
Mr Moricand[53] of Geneva.
Prof Savi[54] of Pisa
Profr Jacquin[55] & Schreber[56] of Vienna &c., &c

In America

Prof S L Mitchill of New York
Dr John Torrey of New York Vice Prest. of the Lyceum
Governor Dewitt Clinton
Zaccheus Collins Esq Vice prest of the Academy,
Mess Haines,[57] Ord,[58] Dr Mease,[59] &c, of Philadelphia
Prof Hall[60] & Mr Hayden[61] of Baltimore
Stephen Elliot Esq Prest of the Philosophical Society of Charleston, &c, &c.

Extracts from a Testimonial Letter of the Lyceum of New York

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[47] Simon Barthélemy Joseph Noël (1765–1822), French naturalist

[48] Étienne Geoffroy Saint-Hilaire (1772–1844), French naturalist.

[49] Jean Baptiste van Mons (1765–1842), Belgian chemist and pomologist

[50] Pedro Augusto Jose Drapier (1778–1856), Belgian chemist

[51] Probably Friedrich Gottlob Schultze (1795–1860), German economist.

[52] Johann Jacob Romer (1763–1819), Swiss botanist

[53] Moise Étienne Moricand (1780–1854), Swiss botanist.

[54] Paola Savi (1798–1871), Italian naturalist

[55] Nicolas Joseph Jacquin (1727–1817), Dutch botanist

[56] Johann Christian Daniel von Schreber (1739–1810), German naturalist.

[57] Reuben Haines (–1831), American philanthropist.

[58] George Ord (1781–1866), American naturalist.

[59] James Mease (1771–1846), American physician and naturalist.

[60] Probably John Elihu Hall (1783–1829), American author

[61] Probably Horace H. Hayden (1769–1844), naturalist and dentist.

"It is our opinion that the said C. S. Rafinesque is a learned and distinguished Naturalist. His zeal & Science are of a very high Order His manners are modest and unassuming We entertain a well grounded expectation that this Gentleman will greatly enlarge our knowledge in Natural Sciences &c "
New York 6th April 1818

Extract of a Letter from Dr Leach to C S R

"I was utterly unacquainted with your excellent little Work (Precis des De'couvertes)[62] when I saw it at Cuvier's (when I was last in Paris) with your other works. I send you some of my Works I detest as well as you the imperfect and artificial System of the Great Linneus, you deserve credit for Introducing the Natural Methods in America &c "
London 15th Septr 1818.

Extract of a letter from Cuvier (translation)

"I have been much pleased to find in your Works, many new Animals, and some which I thought new, although you had detected them before me I have also found that you have noticed before me many generic and subgeneric Differences. I shall not fail to avail myself of this & the Accounts you give me &c."
Paris 28 April 1818.

Extract of a Letter from Decandolle (translation)

"You will see in my Species plantarum that I have rendered due justice to your discoveries whenever they were known to me Acquaint me with your new discoveries & I will avail myself of them. &c."
Geneva 6th May 1818.

Extract of a Letter from W Swainson

"I like your Annals of Nature exceedingly, I approve much of the plan and execution I send you many plants, fossils, Shells &c , and Prof Hooker of Glasgow has sent me a fine collection of plants for you &c."
Liverpool June 1820

Extract of a Letter from St. Elliot

"It will give me great satisfaction to maintain with you not a *casual* correspondence, but a steady & friendly intercourse, from which I hope to derive much pleasure & knowledge. I feel duly sensible for the favorable opinion you have expressed of my Botany of the Southern States. I am anxious to see your Annals of Nature, set me down as a Subscriber to it and every other work which you may publish I shall be much obliged to you for hints, notes & any assistance, that shall make my work more correct & valuable &c "
Charleston, 11 July 1817

Sketch of Prof Rafinesque's Collections

His Library consists in about 1000 Select Volumes on Phisics, Chemistry, Natural history, Botany, Mineralogy, Philosophy, Travels & Miscellaneous Works, in Latin, English, french, Italian &c

His Herbarium Contains already about 12000 Specimens, belonging to about 2000 American species & 1000 European or exotic Species, and is increasing every year

His Natural Collection consist in about 2000 Specimens of Shells, fossil remains, Minerals, Insects, Polyps & other zoological Subjects, mostly American

Lexington April 1821
C S R

Lexington Kenty
Transylv Uny 2d Feby 1822[63]

Honble Ths Jefferson
Monticello
Respected Sir!

I take the liberty to send you the Kentucky Gazette[64] containing the first number of a Series of Essays under the name of the Cosmonist,[65] and shall regularly send you the other numbers, hoping that they will afford you some gratification

I am rather anxious to hear something precise concerning the University of Virginia, and my prospects relating thereto, since I have some expectation to be offered the Presidency of the Cumberland College of Nashville and the Western College of Kentucky seated at Hopkinsville, but although these situations will be highly honorable, the arduous duties belonging thereto would induce me to decline them, if my appointment to the Uny of Virginia was rather proximate and probable

I would consider it as a favor, if you would lay this topic before the Board of Trustees of the Uny of Virg. and in addition to what I have already stated at various times, please to acquaint them with the following facts and propositions

There is now for sale in this town, the valuable Museum of my late friend John D Clifford, which contains about 8000 Specimens of Indian Implements (many very rare) Minerals, fossils and animals, many of which are new, undescribed and unique. The price asked for it is $2000 If I should be appointed Professor in your University, I mean to purchase it at my expense and make a donation of it to the University This united to my own Cabinet, which I have largely increased lately, containing now more than 4000 Specimens of Minerals and Animals, and my herbarium, increased to 15000 American and european Specimens, would form the basis of a respectable Museum of about 27000 Specimens, which I offer to the Univ^{y} I would take charge of it, as keeper and Director and oblige myself to increase it annually by collections, exchanges, purchases &c with 2000 Specimens at least, which would make your Museum rich of fifty thousand Specimens in ten years and seventy thousand in twenty, without any charge to the Un^{y}, except providing the rooms and trifling incidental expenses

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[62] *Précis des decouvertes et travaux somiologiques*. Palerme, 1814.

[63] Letter in *Jefferson Papers*, Massachusetts Historical Society

[64] *Kentucky Gazette* . Lexington, 1787–1848.

[65] *The Cosmonist or 15 Tracts on Natural History*. Lexington, 1822.

Moreover should it be the intention and pleasure of the Trustees to have a Botanical Garden, I will take upon me the duties of forming and directing one, if a suitable ground is provided I have now with me 3 Or 400 kinds of seeds lately rec'd from Europe and could annually receive from my friends 1000 species of seeds. I would pay all the expenses attending this Garden except the buildings and salary of a working Gardener I could therefore pledge myself to establish a Botanical garden by degrees say in 3 or 4 years, for \$1000 in buildings & walls and \$2 or 300 annual contingencies & Salaries.

I hope that these propositions will meet your attention, and I trust that you will perceive the necessity of giving me a timely notice of their acceptance Mr Clifford's Museum may be sold away, if much delay is employed, and I require one year to prepare myself for and effect my removal. Should I become President of one of our Western College I must become engaged therein for two or three years at least.

In the hope of soon hearing from you on this Interesting Subject, I remain meantime Very respectfully

Yours &c
C S RAFINESQUE
Prof^{r} in Trans. Un^{y}

PS I sent you last fall a Prospectus of my Miscellaneous Works, I now send you a few copies to be given to some of your fellow Trustees, who are not perhaps acquainted with my Scientific & literary labours.

M^{o}. Feb 20 1822[66]

SIR

I rec^{d} yesterday your favor of the 2^{d}. the accompaniments ment^{d} in it will probably arrive by another mail and shall be disposed of as you desire the prospect of the opening of our Univ^{y} is at present but distant we have incurred a great debt in erecting our buildings on the hypothecn of our funds to redeem which will employ the whole of them for many years, unless relieved by the legislature of which there is little promise at present in this stage of things it would be unjustifiable in me to say anything which should prevent your accepting any offers which you might be disposed to listen to from other quarters our Visitors[67] do not meet till April next then I will lay before them your offers of subjects of Nat^{l} history which they will doubtless consider as evidences of particular liberality.

I pray you to accept the assur^{ce} of my gr^{t} respect
[TH JEFFERSON]

Lexington K^{y} 24th Sept^{r} 1822[68]

Hon^{ble} TH^{s} JEFFERSON
Monticello

RESPECTED SIR!

I beg leave to send you, by mail together with these lines 6 pamphlets cont^{g} a Dozen Memoirs of mine published in Europe in French on Zoology and Botany, and forming the beginning of a long Series of similar Tracts which are Sent printing, forwarded or in preparation Such is the state as yet of Natural Sciences in our Country that I have reluctantly been compelled to send my labours thus far to be published, and only receive them again after a couple of years and travelling 10000 miles! The sequel will be sent to you when it reaches me

Amongst my numerous botanical Discoveries this year in Kentucky, I have found a new, rare and valuable Tree belonging to the genus *Virgilia*, but different from the *Virgilia lutea* of the Mountains of Georgia It is 30 to 40 feet high with broad leaves, like ash-leaves, and it dies a beautiful yellow like the *V lutea* & *V. aurea* I call it *Virgilia frag[rans]* in vulgar language *Yellow Locust*, the country people had no name for it It grows scantily in the bottoms of the River Kentucky, and will grow well in Virginia I send you the inclosed several pods, which you may raise yourself or present to your Agricultural friends It grows quick, has a fine foliage and bloom, but the branches are exceedingly brittle

I have not heard as yet when the University of Virginia is to go in operation Not having heard from you I suppose that my liberal offer was not accepted, and my endeavors to stimulate by my exertions the study of my favorite Sciences will not succeed I wish that passive talents may not be prefered to ardent Zeal and Knowledge without hoping it. Meantime I am on the point of endowing Transylvania University with all my past Collections amounting to about 30000 specimens of plants, animals & minerals, as soon as the Trustees will be able to enter into some needful arrangements in the

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[66] Letter in *Jefferson Papers*, Massachusetts Historical Society.

[67] So far as the Minutes of the Board of Visitors record, Jefferson did not lay Rafinesque's offer before the board

[68] Letter in Tucker-Coleman Collection in Department of Research and Record, Colonial Williamsburg, Inc.

Subject, in which case I shall not be able to renew my offer to the Univ^{y} of Virg[inia] when it might be convenient to accept it.

I wish you health, prosperity, a long and happy life, Meantime remaining respectfully

Your Obd^{t}. Serv^{t}
C S. RAFINESQUE
Prof^{r} &c

Monticello Oct 9 22 [69]

SIR

Your favor of Sept 24 is received, and I thank you for the seeds it covered too old to plant trees for my own gratification, I shall do it for my posterity the pamphlets therein mentioned will probably come by subsequent mails, tho' those mentioned in your letter of Feb 2 did not come the preference given to letters sometimes occasion the Postmasters to omit printed papers you mentioned not having heard from me in answer to that letter I answered it however the day following it's receipt in these words Feb. 20 [70] 'Sir, I received yesterday your favor of the 2^{d} the accompaniments mentioned in it will probably arrive by another mail and shall be disposed of as you desire the prospect of the opening of our University is at present but distant. we have incurred a great debt in erecting our buildings on the hypothecation of our funds, to redeem which will employ the whole of them for many years, unless relieved by the legislature of which there is little promise at present in this state of things it would be unjustifiable in me to say any thing which should prevent your accepting any offer which you might be disposed to listen to from other quarters'

So far my letter of Feb 20 to which no change of circumstance enables me to add any thing more definite I may say further that the torpor of age has nearly extinguished my attention to scientific subjects, and the same cause, with a stiffened wrist, renders writing so slow and painful as to disable me from executing the duties of correspondence. I pray you to accept the assurance of my great respect

TH JEFFERSON

Mr RAFFINESQUE

Lexington Kent^{y}
15th Febr^{y} 1824[71]

Hon^{ble} THOMAS JEFFERSON
Monticello

RESPECTED SIR!

I perceive by the newspapers, that the University of Virginia is to be put immediately in operation: and on that occasion I beg leave to renew my former application, to be considered a Candidate for any Professorship that may be established and for which I may be found fitted I need not repeat my former offers and explanations, hoping that they are still kept in mind I have merely to add that the Sciences which I should prefer to teach above all others would be Botany, Zoology, Mineralogy, Geology, Physics, Sometry, Mental Philosophy, The Ancient history of America, Archeology, Universal phonology and Philology, &c being such branches of knowledge in which I have made the most important discoveries and researches

The best proofs and recommendations which I can exhibit, consist in my works on these subjects and other departments of Science A Catalogue of my latest Works and Manuscripts is accordingly inclosed to which I call your attention and which I hope you will comunicate to the Trustees of the Virginia University for their consideration

If under the untowards Circumstances in which I have been placed during the last Six years, I have been able to labour so far in the field of Science, I hope that you will do me the justice to believe that under better auspices, my zeal and Industry would be prompted to achieve much more

Since two years past, I have been honored with the title of Doctor of Philosophy by the University of Bonn in Germany, and become member of many learned Societies We have also formed here a Kentucky Institute of which I am Secretary

The Legislature of Kentucky has chartered at my solicitation a Botanical, Agricultural and Medical Garden in Lexington, but as it has received no endowment and depends on subscriptions for support, it may languish for a long while

The West is not yet mature for Sciences, and I wish to leave it for a wider field If I become a Member of the University of Virginia, I pledge myself to labour ardently to render it conspicuous in my Department The number of Manuscripts which I have named to you and many others only begun, which will have little chance of seeing the light in Kentucky, may then appear at once, or as soon as improved and matured The mountains of Virginia will offer me a wide field of researches and invite my zealous attention

Let me conclude by stating that whatever may be done for me, will be for the immediate advantage of Science, Instruction and Knowledge Since I have long ago dedicated myself to them, with heart and Soul Meantime I remain respectfully and Sincerely

Honored Sir!
Your humble & Ob^{t} S^{t}.
C S RAFINESQUE

[Inclosure]

Catalogue

Of the principal Works, Essays & Manuscripts published or written by C S Rafinesque A M,

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[69] Letter in *Jefferson Papers*, Massachusetts Historical Society.

[70] See letter, Jefferson to Rafinesque, February 20, 1822.

[71] Letter in *Jefferson Papers*, University of Virginia.

Doctor of Philosophy, Prof^r in Transylvania University, member of 15 learned or literary Societies in the United States or in Europe &c., in the year 1818 1819 1820 1821. 1822 & 1823.

I Printed in 1818

1 Florula Ludoviciana or Plants of Louisiana New York
2 Several Reviews in the American Monthly Magazine N Y
3 Survey of the progress of Natural Sciences in the United States from 1801 to 1817 A M Magaz
4 Museum of Natural Sciences or Several Essays on Botany, Zoology &c, in the Am My Mag
5 Description of many new spunges, in Silliman's Journal
6 Description of 3 new genera of Plants, in Ditto.
7. Several other tracts in the same Journal

II Printed in 1819

8 Prodromus of 70 New Genera of American Animals and fossils, published in Paris—Journal de Physique
9. Prodromus of 50 new genera of Amer Plants—Ditto
10 Remarks on American Botany Paris Ditto
11. Review of Nuttall's genera of Amer. plants, New York
12 Monography of American Aphides N Y
13 Several other Essays in the Amer. My Magazine
14 Memoir on the genus Florkea. Newhaven. Sill. J
15 Memoir on Atmospheric Dust Ditto.
16. Several other Memoirs & Essays in Ditto
17 Description of two new genera of Fishes, from the River Ohio In the Journal of Acad Nat Sc Philadelphia.

III Printed in 1820

18 Annals of Nature, cont^g 25 new genera and 120 new species of Amer Animals & Plants Lexington
19. Monography of the Ohio Catfishes London. J. R. Instit.
20 Many Essays in the Western Review. Lexington.
21 Antiquities of Montgomery-County Lexington
22 Monography of American Roses. 30 species—in the Journal of Physical Sciences of Bruxelles
23. Monography of the Shells of the Ohio 70 species. Ditto
24. Synandrical Nomenclature. Ditto.
25 Classification of the Plants Endogyne, &c Ditto.
26 On the Polystome and Porostome Animals. Ditto
27 On the Turbinolites of Kentucky Ditto
28. Many tracts in the Western Review.

IV Printed in 1821

29 Moral and Political Wisdom In the Western Minerva like the 3 following tracts.
30 On the Sidereal Bodies.
31 On the Antiquities of Fayette County, Kentucky
32 Many other Scientific & literary essays, in W M
33 Ichthyology of the River Ohio, containing 38 Genera and 110 Species, mostly new Lexington
34 Remarks on the Convolvulaceae, Bruxelle Annals Sc
35. Reform of the Genus Lysimachia. Ditto
36 On Hybrid Animals, the Manis Ceonyx, Viscum &c. Do

V Printed in 1822

37 Psyche or the Immortality of the Soul Lexington
38. The Cosmonist or 15 Tracts on Natural History Do
39 Florula Mandenensis.
40 Monography of Brachiopites. Bruxelles
41 Principles of Osmics or Classification of all the Vegetable odors Bruxelles.
42 On 18 new families of Dicotyle Plants London.
43 Review of Zoology in the United States.
44 Survey of all the Meteors. London

VI Printed in 1823

45. Classification of Cephalopode Animals, Bruxelles.
46. Description of 2 new genera of parasite Animals
47. [This number and title omitted by Rafinesque.]
48 Description & figures of 30 new Atlantic Fishes.
49 Many other Memoirs in European Journals.
50. Erpetology of the United States First part, the Turtles.—&c, &c., &c.

VII Manuscripts read to the Kentucky Institute

51. History of the Shawanee Nation.
52. On the Geology of Kentucky.
53. On the Three great Aboriginal Nations of North America, the Talegans, Iztakans and Oguzians.
54 On a new kind of opium called opicrine, produced by a new Kentucky plant, the *Prenanthes opicrina*.
55 Description of the falls of the Cumberland River with maps.

56. On the Physical Geography of North America
57 On the Elevation of land in Kentucky with Views.

VIII Manuscripts already published

58. Lectures on Public Instruction, the human mind &c
59 Lectures on Botany and Medical Botany
60 Lectures on Zoology and Animals
61 Lectures on Mineralogy and Geology

IX Manuscripts sent for publication

62 Monography of the Genus Trillium 20 species
63 Terrestrial Conchology of Kentucky
64 Sinopsis of 50 new Quadrupeds of North America.
65 Physical Map of the River Ohio
66 Flora of the State of Ohio or Catalogue of its plants
67. Annals of Kentucky, abridgement of the Ancient history from earliest times to 1780
68 Enumeration and description of all the Ancient Monuments of North America about 1800 of which 510 are found in Kentucky.
69 Itinerary of Soto and Moscosa in the United States between 1539 & 1543, including the discovery of Tennessee, Kentucky, Alabama, Louisiana, Arkansas, Missouri, Illinois &c.

X Unpublished Manuscripts

70 Principles of Oreology and Cartography or the Study of Mountains and Valleys.
71 Analysis of the human Mind and will
72 Theory of the Invisible Worlds.
73 Sometry or the Geometry of irregular Bodies
74. Social and political Harmony
75 Description of 20 New Genera and 100 New Species of Plants from Kentucky, Illinois, Missouri, Ohio &c
76 Ornithology of Kentucky, 250 species.
77. Monography of the Salamanders of North Amer fig
78 Description of Several new physical Instruments, such as the Nemeter, Platometer, Phosometer, Stereometer, Sclerometer, Spirometer, Diploscope &c.
79 Geology of the River Hudson fig
80. Recollections of Sicily, Mt Etna &c
81. Visit to the Azores Island in 1815,
82, Fossil Conchology of Kentucky.
83. Monography of the American Trilobites, Bilobites & a new genus Isoctomesa.
84. New Elements of Cryptography or Secret Writing.
85. Elements of Universal Phonology
86. Memoirs on the American Languages
87. Description of the Ancient Monuments of Kentucky and the Surrounding States with 100 plans, Views
88 Picture of Kentucky or Statistical Description &c
89 Statistical and physical Map of Kentucky, 16 miles to the inch.
90 Annals of the ancient History of North America.
91 Travels in the States of Vermont, Connecticut, New York, New Jersey, Pensylvania, Delaware, Maryland, Virginia, Ohio, Kentucky, Indiana, Illinois, &c
92 Tellus or Chronological Annals of the Earth, includ^g the astronomical, geological and historical period of its existence and revolutions, with the Annals of Nations, Empires, Confederations, &c
93 Picture of all the Ancient Inhabitants of North America, divided in 12 nations and 1000 Tribes.
94 Thoughts on philosophical Subjects
95 Amenities of Nature or Collection of 150 Tracts on all the branches of Physical Knowledge
96 Medical and physical Essays, about 50
97 Several small Poems, Despondency, Smiles, Tecumseh, Sense and Beauty, Conjugal Love, &c
98 Many poetical trifles in English, french and Italian
99 On 50 New Medical plants of North America
100. Decimals and vocabularies in about 200 Languages

Lexington Ky 1st July, 1824[73]

RESPECTED SIR!

A Letter of yours printed in some Journals and directed to the Moderator of a Society for promoting Comunities, has given me the first knowledge of such a useful and philanthropic Establishment As your Letter does not mention the name of the person to whom it is directed, nor of the place in Virginia where their Settlement is forming, and I wish to know more of the plan, I have written the enclosed Letter, and taken the Liberty to send it through your means, since you must be able to transmit it, and know to whom, by filling the blank name of said moderator It would gratify me to know his name and the place of the settlement undertaken.

The Circulars and Catalogues of the first Botanical, Agricultural and Medical Garden in the Western States, which I have succeeded to establish in Lexington, have lately been sent to you

Mr Humphrey Marshall is publishing a second edition of a history of Kentucky carried to the present time I have furnished him an Introduction or sketch of the Ancient History, of this Region, which will form a pamphlet by itself. A Copy will be sent to you in a short time You will perceive that I have begun to explore with some attention the wide and fruitful field of American Ethnology I am collecting materials for a more extended Work or Works on the Ancient History, Antiquities, Languages and Ethnology of North America Comparative Philology is now becoming in Europe the base of History and I have studyed it deeply, comparing 400 Eastern languages with about 85 American languages of which I have Vocabularies, and have succeeded to class them like Klaproth & Adelung have classed the Eastern Nations.

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[73] Letter in *Jefferson Papers*, Massachusetts Historical Society.

The object of this exordium is to prevail upon you (knowing that such an undertaking must meet your approbation) to furnish me if in your power with some additional American Vocabularies I have written in various parts and even to South-America and Mexico, in order to collect additional materials, but I do not know where to apply for the unpublished Vocabularies collected by Lewis and Clarke and am told that they may be in your possession, or at least Copies of them, likewise many Vocab collected by Pike and others The languages or Dialects which I am anxious to see, not having met them yet in any printed Work are the following,

Chopunish All the Creek dialects
Columbia dialects except Muscolgee & Uchee
Cadue of Louisiana & Cerris &c
Comanchee Texas or Teguas &c.
All the Nations of Louisiana mentioned by Pike, except those on the Missouri
All the Languages of Mexico except the Aztec, Tocunchi and Darien

If any of these Vocabularies are in your possession, or you can inform me where they are to be found, you will render a service to Science by informing me, and suitable means may be found to have copies or extracts taken from them

Can you favor me with a copy of the Prospectus of the University of Virginia? or if not printed yet could you favor me with the names of all the Trustees of that Institution?

Who are the Professors selected to teach the Various departments of Natural History, Ancient History, Comparative Philology, Archeology, Ethnology, Agriculture and Geography?"[73]

I propose to publish soon a Picture of Kentucky and have prepared a new map of this State, Geological and Statistical

My discoveries and maps of the Ancient Monuments of North America, must I fear be sent to Europe for Publication, they are too numerous to warrant their publication in this Continent

I remain respectfully
Your Obed^{t} S^{t}
C S RAFINESQUE Ph D

Mont^{o} Aug 11, 24 [74]

SIR

It is with regret I am obliged to return your letter for want of a recollection of the name of the person for whom it is destined and entire ignorance of the place where his society is settled, if they have made any settlem^{t} among the thousand letters a year which have been accumulating with me for 60 years, it is impossible for me to find any particular one unless I know under what name to look for it

I formerly had a considble collection of Indian vocabularies the great part of which were lost in my removal from Washington and the residue sent to the Hist Comm^{ee} of the Ph Soc at Phila it is not therefore in my power to contribute any thing to the enlargement of the pamphlet you have been so kind as to send me, & for which I pray you to accept my thanks, and for a reason equally strong that I am become from age and debility so entirely unequal to the labors of writing that I have been obliged to withdraw from all correspd^{ce} whatever it is time for me to resign to younger hands the cares of literature and all other cares whatever to which, while I had power, I have been always willingly subservient with my regret that I cannot be useful to your labors, accept assurances of my respectful considn

TH. J

MR RAFFINESQUE

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[73] This was Rafinesque's last inquiry about the university In Jefferson's reply to this letter, which follows, it is interesting to observe that he did not answer Rafinesque's questions about professors or mention the university Before the date of Jefferson's reply, Francis Gilmer, of Virginia, had been sent to Europe, by Jefferson, to engage professors for the university On March 5, 1825, the Board of Visitors of the university passed the following resolution "Resolved, that Doctor John Patton Emmet, of New York, be appointed professor of the school of natural history" With this appointment Rafinesque lost his last chance of holding a professorship at the university

What did Rafinesque lose and what did the University of Virginia lose by his failure to be appointed to the faculty of the university? We can only surmise that both would have gained considerably by the appointment.

[74] Letter in *Jefferson Papers*, Massachusetts Historical Society.

THE PHILOSOPHICAL MEANING OF THE COPERNICAN REVOLUTION

PHILIPP FRANK

Harvard University

(*Read April 24, 1943*)

We have heard, during this meeting, of several two-hundredth anniversaries. The American Philosophical Society was so kind as to invite me to speak on a four-hundredth anniversary. I appreciate highly this opportunity which was given to me to address this distinguished group on Copernicus. In 1543, four hundred years ago, Copernicus died. This year was in a certain sense also the year of the birth of the Copernican system. His great book, *The Revolutions of the Celestial Bodies*, was published in the same year 1543.

However, to keep in line with the general spirit of this meeting, we may ask whether there is some connection between Copernicus' great book and American history. The answer is "yes, and very much so." When this book was published, nearly fifty years had passed since Columbus discovered America. This event was one of Copernicus' starting points. He refers in one of the first pages of his book to this discovery as the final proof of the spherical shape of the earth. (Incidentally, he does not mention Columbus and says, as a matter of course, that "America is named after her discoverer.") The earth was now definitely a globe, and, to speak in terms of today, "global thinking" could start.

To understand a phenomenon means to interpret our present experience as the repetition of a similar phenomenon of the past. This is true in science, but it is true as well in history. Today, we understand the French Revolution better than our parents did because we are contemporaries of the Russian revolution, and we understand the Copernican revolution better than nineteenth century scientists did because we are contemporaries of the Einsteinian revolution.

Let us formulate the central problem of all philosophy of science in the simplest possible terms. We have to face two worlds on one side, that of our sense observations, *e. g.*, in astronomy, the observed positions of the stars in the sky; on the other side, that of the general principles of science such as the law of gravitation, the principle of relativity, etc. To what extent or to what degree are these general principles justified by those sense observations?

This sounds simple enough, but to appreciate the immense gap between these two worlds means to start grasping the central problem of all philosophy of science. Unfortunately, the pedagogical effort of science teachers has been often directed towards camouflaging this gap. If, however, the very goal of science teaching is to help the students in the understanding of nature, the actual depth and width of that gap has to be emphasized over and over again. The state of mind acquired by the average student of science as the result of inadequate training has been largely responsible for the failure to appreciate exactly the philosophical meaning of the Copernican revolution.

Only recently, under the violent impact of twentieth century physics, particularly the Theory of Relativity, have the eyes of science students been opened and has the meaning of the Copernican revolution become clear.

If we look into a typical textbook or listen to an average teacher, we would learn: before Copernicus, men believed in the testimony of their senses telling them that our earth is at rest and that the planet Jupiter traverses in twelve years a closed orbit on the celestial sphere and that this curve contains twelve loops. Finally, Copernicus recognized the fallacy of this testimony and proved that "in reality" our earth is in motion and that the planet Jupiter traverses "in reality" a smooth circle around the sun as center. Copernicus exposed the illusions of our senses. Human reason thus scored a clear victory in its struggle against "naive" sense experience.

This description of Copernicus' achievement seems to me, conservatively speaking, inadequate. The loops traced by the planets are by no means a sort of optical illusion and the immobility of the earth isn't either. As a matter of fact, the planet Jupiter actually traverses every year a loop with respect to a system of reference which participates in the annual revolution of the earth But the same Jupiter traverses just as truly every twelve years a smooth circle with respect to the system of fixed stars. Neither the loops nor the smooth circle are results of our "naïve" sense experience. They are two different diagrams representing one and the same set of sense observations. Therefore, the interpretation of Copernicus' achievement as a victory of abstract reason over naïve sense experience is hardly justifiable

However, we meet occasionally a second interpretation which says almost the opposite of the first one The hard facts of our sense experience became more and more incompatible with medieval philosophy, which had its roots in speculative reasoning rather than in sense observation Copernicus finally decided to overthrow the obsolete doctrines of Aristotle and Ptolemy and scored a victory for experience in its struggle against pure speculation As a matter of fact, Copernicus was not particularly "tough minded," if we may use the famous phrase of William James to describe the empirical scientist as distinct from the "tender minded" believer in pure reasoning No new facts had been discovered by Copernicus, which had forced him to abandon the geocentric doctrine The astronomical tables calculated from the Copernican system were in no better agreement with the observed positions of the stars than the previous tables.

Therefore we have to start from the fact that the Copernican revolution meant neither a victory of reason over the illusion of our senses nor a victory of hard facts over pure speculation To be sure, Copernicus invented a new pattern of description for our observations. His genius manifests itself in the beautiful simplicity of this pattern

Copernicus died in 1543. The Roman Holy Office did not utter an official judgment on the Copernican system until 1616, seventy-three years after Copernicus' death This Roman verdict will give us the best hint about the philosophical meaning of the Copernican revolution. For the verdict considered specifically the philosophical merit of the new system. The Copernican theory was called "philosophically foolish and absurd"

But not even Copernicus' greatest opponents ever doubted that his system meant a great advance in astronomy The general opinion in these quarters was that the heliocentric system is "astronomically true," or as it was sometimes phrased, "mathematically true," but in any case "philosophically false or even absurd."

We have to do here with a conflict between two conceptions of truth. This conflict has existed through the ages and has created quite often a great confusion of mind. This double meaning of truth has never been dramatized as clearly as by the Copernican revolution and its repercussions. To understand and to evaluate this conflict is the great lesson we can learn from the history of the Copernican ideas.

The medieval philosopher St Thomas Aquinas described very distinctly two different criteria of truth

> There are two ways to prove the truth of an assertion The first way consists in proving the truth of a principle from which this assertion follows logically. In this way, one proves in physics the uniformity of the motion of the celestial spheres The second way does not consist in proving a principle from which our assertion can be derived but in assuming our assertion tentatively and in deriving results from it which can be compared with our observations In this way one derives, in Astrology, the consequences of the hypothesis of eccentrics or epicycles concerning the motion of celestial bodies However, we cannot conclude in this way that the same assumptions cannot be derived, perhaps, from a different hypothesis also (Free translation from *Summa Theologica*)

If a statement of astronomy met only the second criterion, the agreement with observed facts, it was termed "mathematically true" Only if it met also the first criterion, *i e.* if it could be derived from an evident principle, was it recognized to be "philosophically true." Since Aristotle's physics was supposed to be derived from evident principles, "to be philosophically true" meant practically "to be in agreement with Aristotelean physics."

As Copernicus had been anxious lest his system might not be philosophically true in this sense, he feared some trouble on the part of theologians who were strict believers in Aristotelean philosophy He looked for advice on how to behave in this situation, and strange as it may seem to us, the Catholic churchman Copernicus asked a Lutheran theologian from Nuerenberg how to avoid trouble The Nuerenberg scholar, Osiander, answered him in a letter of 1541:

> As for my part, I have always felt about hypotheses that they are not articles of faith but bases of calculation. Even if they are false, it does not matter much provided that they describe the ob-

> served phenomena correctly. It would, therefore, be an excellent thing for you to play up a little on this point in your preface For you would appease in this way Aristoteleans and theologians, the opposition of whom you fear

This advice meant precisely that Copernicus should not claim "philosophical truth" for his system but should be satisfied with a claim for "mathematical truth"

But Copernicus did not like this compromise He claimed his system to be at least as philosophically true as the Ptolemean system, and perhaps even more so In this way a conflict flared up, the issue of which was a very subtle distinction Was the Copernican doctrine a true description of the Universe or was it merely an hypothesis which served to calculate the positions of the stars? And how did Copernicus himself look upon this question? Most of the scientists of today are accustomed to regard every theory as a working hypothesis only, and would hardly be prepared to give serious thought to that subtle distinction which is rather an issue of the philosophy of science But if we go a little deeper into the logical structure of science, we have to recognize that, as a matter of fact, every scientific theory, of whatever period, had to meet the two requirements of a "true theory" which were already familiar to Thomas Aquinas. In reality, no theory was accepted merely because it was a good working hypothesis. In every period of the history of science a theory had to be in agreement with the general principles of physics. The physicists of the nineteenth century would have hardly admitted a theory which had been in disagreement with the principle of the conservation of energy

For that reason, practically every theory has been a compromise between these two requirements. This is particularly true for the Ptolemean system We read and hear frequently that the Ptolemean system was in agreement with the Aristotelean philosophy and physics. But Copernicus, we are told, disturbed this harmony and advanced a theory which would contradict explicitly the laws of medieval physics. This was certainly not the opinion of the medieval philosophers themselves. One of the basic principles of medieval physics was the law that terrestrial bodies move in rectilinear paths towards the earth or away from the earth while celestial bodies move in circular orbits with the earth as center, but the Ptolemean system assumes that sun and planets traverse eccentric circles or epicycles the center of which is not the earth Therefore the Ptolemean system could not be regarded as philosophically true, but at most as a hypothesis which might serve as a basis of calculation

Thomas Aquinas judged the Ptolemean system as follows

> The assumptions made by the Astronomers are not necessarily true Although these hypotheses seem to be in agreement with the observed phenomena we must not claim that they are true Perhaps one could explain the observed motion of the celestial bodies in a different way which has not been discovered up to this time

The Arabic philosopher Averroes (of the twelfth century) and his school emphasized very strictly the philosophical criterion of truth and declined to ascribe any truth value to the Ptolemean system Says Averroes

> The astronomers start from the assumption that these (eccentric or epicyclic) orbits exist From this assumption they derive results which are in agreement with our sense observations But they have not proved by any means that the presuppositions from which they started are, in turn, necessary causes of these observations In this case, only the observed results are known but the principles themselves are unknown, for the principles cannot be logically derived from the results Therefore new research work is necessary in order to find the "true" astronomy, which can be derived from the true principles of physics As a matter of fact, today there is no astronomy at all, and what we call astronomy is in agreement with our computations but not with the physical reality.

The common opinion among the philosophers was rather that the true picture of the universe cannot be discovered by the astronomer who is restricted to find out what hypotheses are in agreement with observed facts If different hypotheses meet this requirement, science cannot decide which is true and, as the Jewish medieval philosopher, Moses Maimonides, puts it "Man knows only these poor mathematical theories about the heaven, and only God knows the real motion of the heaven and their causes"

It is certain, therefore, that before the Copernican revolution, no theory of the motions of the celestial bodies existed which would meet both criteria of truth. There was in every theory a discrepancy between mathematical and philosophical truth Against this background we have to interpret the famous dedication letter which Copernicus published as a preface to his great book and in which he recommended his work to the goodwill of Pope Paul III.

Copernicus affirms that he did not advance his new theory of the motions of the heavens in a spirit of opposition against the established doctrine. His only motive was his conviction that there was no established doctrine. The hypothesis of a circular motion of planets around the earth as center did not account for the observed facts, and the hypotheses of eccentrics or epicycles were not in agreement with the general principles of physics which required uniform circular motions around the earth as center. Since no doctrine existed which could be regarded as "true" from the philosophical as from the mathematical angle, Copernicus felt free to suggest a new hypothesis assuming the mobility of the earth.

This hypothesis accounted for the observed motions nearly as well as the Ptolemean theory of epicycles, but removed some of the epicycles The motions of the planets became now circular orbits around the sun as center—except for the epicycles which were necessary to account for the inequalities in the motion of planets. In any case there were fewer epicycles and more homocentric orbits in the Copernican, than in the Ptolemean, system Therefore Copernicus claimed that his theory was in some sense nearer to the requirements of Aristotelean physics than the geocentric system. The Ptolemean system was a compromise between the two criteria of truth Copernicus claimed that his system was in the same sense a compromise and, as he believed, a better one

In any case, Copernicus claimed to give in his theory a true picture of the Universe, true in every sense of the word By a strange coincidence, Copernicus' book was edited by the same Osiander of Nuerenberg whose advice Copernicus did not like to follow We understand now the famous words of the editor's preface, which had been originally ascribed to the author himself but which reflects only the editor's opinion. "The hypotheses of this book are not necessarily true nor even probable. Only one thing matters. They must lead by computation to results which are in agreement with the observed phenomena."

While Copernicus tried to achieve the compromise by arguing that his theory is to a large extent in agreement with the principles of Aristotelean physics, Galileo Galilei, in his famous *Dialogue on the Copernican and Ptolemean World Systems*, went a good deal further in the overthrow of medieval science. He no longer attempted to reach the compromise by adjusting his working hypotheses to the requirements of the established principles of physics. On the contrary, he ventured to adjust the principles of physics to the best suitable working hypotheses This meant to drop the bulk of Aristotelean physics and to start a movement in science which led in time to the philosophy of science which we would call today positivism or pragmatism The two criteria of truth which were for medieval thinkers like St. Thomas Aquinas two distinct requirements, have fused more and more in one single requirement to derive the best description of the observed phenomena from the simplest possible principles, while these principles are justified solely by the fact that they permit this derivation.

Galileo's ideas were not brought into a coherent system of propositions until Isaac Newton advanced his celebrated Laws of Motion in his *Mathematical Principles of Natural Philosophy*. This book appeared in 1687, approximately 150 years after the Copernican revolution. From the Newtonian principles the Copernican doctrines could be logically derived. Therefore, to the believer in these principles, the Copernican system was now true in the full sense of the word, philosophically and mathematically true

Let us now ask what did the Copernican hypothesis look like when it was derived from the Newtonian principles? It said that the earth is rotating with respect to absolute space and that the planet Jupiter traverses smooth circular orbits with respect to absolute space But Newton himself was very well aware that "speed relative to absolute space" has no *operational* meaning, to use P. W. Bridgman's term, *i. e.*, that by no physical experiment can the speed of a body in rectilinear motion with respect to absolute space be measured.

Therefore, the Newtonian system of principles is not a logically coherent system within the domain of physics. Newton himself restored logical coherence by enlarging his system of physical statements by the addition of some theological propositions. As we read in Burtt's book on the *Metaphysical Foundations of Modern Physical Science*,

> Certainly, at least God must know whether any given motion is absolute or relative. The divine consciousness furnishes the ultimate centre of reference for absolute motion. Moreover the animism

in Newton's conception of force plays a part in the premises of the position God is the ultimate originator of motion. Thus real or absolute motion in the last analysis is the expenditure of divine energy. Whenever the divine intelligence is cognizant of such an expenditure the motion so added to the system of the world must be absolute

Under the influence of the spirit of the eighteenth century the mixing of theology into science began to be regarded as illegitimate Strange as it may be, by the abandonment of theological argument the Newtonian physics lost logical coherence

Burtt says very correctly "When in the 20th century Newton's conception of the world was gradually shorn of its religious relations, the ultimate justification for absolute space and time as he had portrayed them disappeared and the entities were left empty."

Therefore the new principles of physics from which the Copernican theory could be derived were far from being satisfactory. The "philosophical truth" of the Copernican system was still a doubtful thing.

Towards the end of the nineteenth century, Ernst Mach exposed very specifically the logical incoherency of the Newtonian Mechanics as a purely physical system. He claimed on good grounds that the principles from which the Copernican system was derived are essentially theological or metaphysical principles. As Averroes had in the period of the Ptolemean system, Ernst Mach claimed in the nineteenth century: we have no true astronomy, if "true" means derived from a coherent system of principles of physics

Mach asked for the removal of the conception of absolute space from physics and for a new physics which contains only terms which have within physics, to speak again with Bridgman, operational meaning.

This program, however, was not carried out until Einstein created his general theory of relativity and gravitation between 1911 and 1915 This theory, as a matter of fact, was the first system of purely physical principles from which the Copernican system of planetary motions could be derived. But the description of these motions looked now very different from the way it had looked as derived from Newton's principles. The conception of absolute space was no longer present. Therefore the statement of the rotation of the earth and of the smooth circular orbits of the planets had now to be formulated quite differently.

From Einstein's principles one could derive the description of the motions of celestial bodies relative to any system of reference One could demonstrate that the description of the motion of planets becomes particularly simple if one used the system of fixed stars as a system of reference, but there was no objection to using none the less the earth as system of reference In this case, one obtains a description in which the earth is at rest and the fixed stars are in a rotational motion. What appears to be in the Copernican heliocentric system the centrifugal force of the rotating earth becomes in the geocentric system a gravitational effect of the rotating fixed stars upon the earth.

The Copernican system became for the first time in its history not only mathematically but also philosophically true But at the same moment the geocentric system became philosophically true, also The system of reference had lost all philosophical meaning For each astronomical problem, one had to pick the system of reference which rendered the simplest description of the motions of the celestial bodies involved

The reception of the Einsteinean revolution by the scientists of the twentieth century reminds us in many respects of the reception of the Copernican revolution by the scientists of the sixteenth century This comparison might help us to understand the philosophical meaning of both

We may take as an example the way Einstein deals with the contraction of moving bodies in the direction of their motion The verdict of quite a few twentieth century physicists was: the theory of relativity permits us to derive the observed phenomena from hypothetical principles but it does not give a physical explanation of the contraction. This was an exact repetition of the Roman verdict against the Copernican system. For the meaning was: the Theory of Relativity may be "mathematically true" but it is certainly "philosophically false" Now "philosophically false" meant "not to be in agreement with Newton's principles of physics," while in the sixteenth century the same expression meant "not to be in agreement with Aristotle's Physics."

But what are the facts affirmed by the Copernican doctrine which are still accepted today as true? Copernicus proclaimed enthusiastically the sun as the center of the Universe and said "In the center of the Universe the sun has its residence Who could locate this lamp in this beautiful temple in a different or better place than in the center wherefrom it can illuminate the whole of it simultaneously?"

Even if we restrict the meaning of the word "Universe" to our galactic system, the Milky Way, this Universe is not spherical and the sun is not located in the center It has been known for a long time that our galactic system has the shape of a lens Before the distance of very remote stars could be estimated, it was plausible to believe that our sun with our earth as attendant is located in the center of this lens However, in the twentieth century new methods were developed to estimate the great distances of remote stars, to a large part by Harlow Shapley and his collaborators of the Harvard Observatory. In particular, Shapley found out that our sun is not located near the center of that lens, but approximately 30,000 light years away from it. This means that the sun with our planetary system is near the edge of the lens. According to Copernicus, we inhabitants of the earth have no longer the great satisfaction of being the center of the Universe, but we have at least the small satisfaction of being the attendant of a master who has his residence at this center But according to Shapley, man has lost all reasons for complacency He is not even the attendant of a master who occupies the central stage of the Universe.

Copernicus probably believed that the orbits of celestial bodies can be described in the best and simplest way by taking the sun as a body of reference. In our twentieth century, we know that this cannot be true universally. According to Einstein's Theory of Gravitation, there is no "all-purpose system of reference" Copernicus' suggestion to use the sun is only practical if we restrict ourselves to the motions in our planetary system For every particular purpose a particular system may be the most suitable

Copernicus did not discover any new fact which could be regarded as established for all eternity. But he denied to the earth the role as the only legitimate body of reference, he demonstrated that the sun is the most suitable system for a particular purpose, and cleared the way for the great new truth that we have complete freedom in our choice of a system of reference.

The Copernican revolution did not wind up by replacing the earth as master of the Universe by the sun or the absolute space, but it was only the first step in a series of revolutions which climaxed, so far as we know today, in depicting a democratic order of the Universe in which all celestial bodies play an equal part.

FRENCH REFUGEES OF 1793 IN PENNSYLVANIA[1]

ELSIE MURRAY

Tioga Point Museum, Athens, Pa.

(*Read April 24, 1943*)

One hundred and fifty years ago a unique refugee colony, the destination of which was the North Branch of the Susquehanna, set out from Philadelphia. In 1795 La Rochefoucauld-Liancourt, distinguished guest-member of the American Philosophical Society while in exile, visited the new town, later devoting 20 pages of his *Voyage dans les États Unis d'Amérique* to it, and prophesying a prosperous future. In 1903 and 1917, L. W. Murray, descendant of a refugee, published a fuller account of the colony under the title *The Story of Some French Refugees and Their "Azilum."*[2] During the past months the last connecting links needed to shape the story into a coherent whole have been assembled from national and state archives, county records and papers in Tioga Point Museum, with the aid of a grant from the American Philosophical Society.

I

Friendly feeling between America and the French people, first fanned into flame in 1777 by young Lafayette's dash across the Atlantic in the cause of freedom, was further reinforced by the eight-years' residence of Benjamin Franklin at Paris. A quaint, sturdy figure, dramatically projected against the ultra-elegance of the Versailles Court, his homely wit, forthrightness of manner, and canny statesmanship won our cause substantial aid in the way of ships, men, and money in the difficult period between 1778 and 1785. Mutual understanding and interest received fresh stimulus from Thomas Jefferson's five-year term as United States minister to France, during the years of intellectual and political effervescence when the Old Régime was crumbling and republican ideals were emerging—from 1785 to 1789.

Therefore in 1793—a century and a half ago—when the French Revolution, after so brave a start, went for a season into reverse, and a panic-stricken Committee of Public Safety began to attack blindly all who had won distinction in the older regime, the thoughts of refugees and exiles of all classes turned naturally toward our young republic—a Noah's Ark of safety for submerging Europe, in the words of Edmund Burke.

Throngs of refugees from the Continent—officers, clerics, scholars, ex-members of the Constituent Assembly—were swelled by shiploads of fugitives from the San Domingan colonies, where premature publicizing of the doctrine of equality had roused native-born African slaves and mulatto plantation-owners against each other and their French officials. Our seaboard cities were crowded with refugee families. Yellow fever (brought by the refugees) had broken out in Philadelphia, our national capital, and elsewhere.[3]

To relieve congestion, an experimental colony far from Philadelphia was projected, with a number of prominent exiles (the Governor of Guadaloupe among them) as backers. The site chosen was hundreds of miles to the north in a region retrieved only a dozen years from its Indian owners. Far up on the North Branch of the Susquehanna, only 25 miles below the New York border, modern maps still show the township of Asylum (a name curiously metamorphosed on French letterheads into "Azilum"). Near by, Homet's Ferry, Dushore, and La Porte perpetuate the memory of members of the refugee colony.

Choice of a site so far in the wilderness, accessible only by rough wagon roads or by boat, has puzzled many a commentator. What clues to the mystery does history offer? Not one but many.

The expansive land development schemes of the era offer one key to the puzzle. At this period Robert Morris, financier of the Revolution, well-known Philadelphia merchant and banker, and Senator from Pennsylvania in 1793, was full of projects for colonizing our wild lands with terrified and distraught families from Europe and the Islands By the same stroke he hoped to repay our heavy war debts and reestablish his own private fortune The well-known Gilbert Stuart portrait of this period shows him in benevolent mood, generously bent on proferring aid to our former comrades-in-arms and their distressed fellow-countrymen Already he and other Philadelphians had acquired thousands of acres of wild lands in the newly annexed sections in western New York State and northwestern Pennsylvania. On neighboring tracts Judge William Cooper (founder of Cooperstown), Captain Charles Williamson (at Bath), and Joseph Priestley's son had already commenced operations.

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[1] Investigation aided by a grant from the Penrose Fund of the American Philosophical Society.

[2] Louise Welles Murray. *The story of some French refugees and their "Azilum."* Athens, Pa., 1903 (ed. 2, 1917).

[3] Frances S. Childs. *French refugee life in the United States 1790–1800.* Baltimore, 1940.

Howell's map of the previous year (1792) shows the Susquehanna's serpentine course across a northern county named for the Chevalier de la Luzerne, Minister from France during our Revolution—a frontier county only six years earlier cut out of the original sprawling Northumberland Across the upper section of Howell's map is inscribed the legend "Country abounding in the Sugar Tree," a second clue to the despatching of refugees from the Islands to this location. For many of the refugee families came from the sugar plantations of the French Antilles; and prominent Philadelphians, including Henry Drinker and Dr. Benjamin Rush, were interested at the moment in promoting a sugar industry free from the need of slave labor, as records of the period show. One of the chief occupations of the colony at Azilum from the outset was to be the making of maple sugar Later settlers report finding huge sugar kettles abandoned in the bush

Prominent among those who planned the colony was the Vicomte Louis de Noailles (fig. 1), who had played a distinguished role in the siege of Yorktown. A full-length portrait preserved by his descendants shows him in martial guise, as befits the son of a marechal of France. Actually, Noailles appears to have been the most democratic of the Azilum group. His earlier career in the French National Assembly, where he proposed measures marking the final overthrow of feudalism, is historic. A brother-in-law of the Marquis de Lafayette—their wives were sisters—Noailles had been stationed at Newport with our French allies during our War of Independence. Quartered on the family of Quaker Robinson, he had learned English of the 16-year-old daughter of the family, with whom he long maintained a correspondence Descendants of Molly Robinson, who became the wife of John Morton, Philadelphia merchant, live in Germantown today.[4]

FIG. 1. Vicomte Louis de Noailles.

Noailles and his associates, reaching Philadelphia in the spring of 1793, at once took out citizenship papers, and began buying up the titles to 1,200 acres of land lying in a bend of the Susquehanna. One of the 44 maps of a second survey of the colony's lands, made in 1802 by Samuel Baird and showing among the original warrantees the names of many well-known Philadelphians

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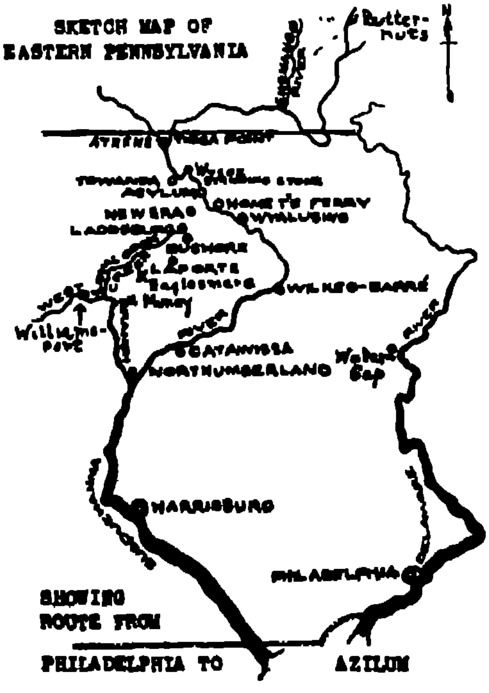
[4] Anna Wharton Wood. The Robinson family and their correspondence with the Vicomte and Vicomtesse de Noailles. *Bull. Newport Hist. Soc* 42, 1922.

(Shippens, Strawbridges, Merediths, Whartons), shows the bend selected At a point on the northeast the words "Standing Stone" are decipherable This huge slab of rock, rising out of the water on the west bank of the river, at the foot of a precipitous cliff, was an old Indian landmark—Ossinpachte The first letters from the colonists carry the heading "Standing Stone"

Modern guide maps locate the site, known today as Frenchtown, on the west bank, between two near-by villages in neighboring oxbows of the Susquehanna on the east bank—Wysox to the north and Wyalusing to the south (map 1) Both were embryo settlements only in 1793 Today, bridges at the two villages form the best approach to the site, for the highway here follows the east bank A short distance below, an old Indian lookout, Wyalusing Rocks, jutting out 500 feet above the river, is characteristic of the picturesqueness of this section. For here the river winds between precipitous wooded hills, in a valley not unlike the famous one of the Loire in old Touraine, though no fortresses and châteaux crown the cliffs of the Susquehanna A quarter of a century earlier another group of fugitives, Papoonhank and his kin, an agricultural colony of Delaware Indians, under the tutelage of Moravian missionaries from Bethlehem, occupied the flats below—known as Friedenshutten, Tents of Peace Their cornfields it was that attracted the first pioneers to this section A plot near the Delaware waterfront in Philadelphia, standing vacant even today, is sacred to the memory of these Moravian Indians through the will of William Penn

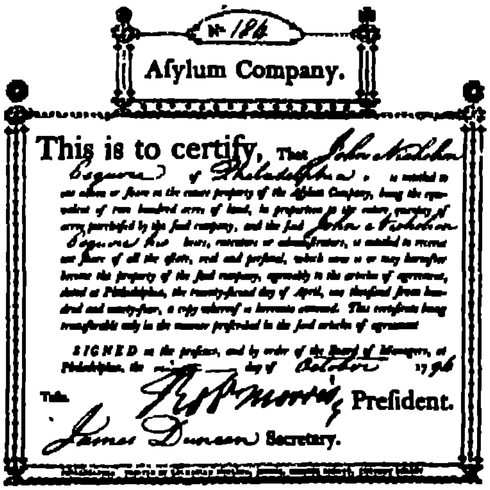


MAP 1. Location of Azilum in northeastern Pennsylvania.

Within a great oxbow of the river, guarded on three sides by water as by a moat, protected in the rear by wooded ridges, the refugee village was plotted by a French engineer Even today it is accessible only by so tortuous a route that the tourist often loses his direction The town was laid out on a gridiron pattern, like Penn's Philadelphia, with broad streets running north and south and east and west On lands long partially cleared by the Moravian Indians and others, forty to fifty houses were soon under construction, and an ex-cavalry officer began to direct further clearing and removal of stumps A surveyor's copy of the original map has been carefully preserved, showing a central market place and other features, with a symbolic group of refugees in water-color

Noailles' first partner was an ex-judge, royal governor of the Châtelet, sister prison of the Bastille, at the opening of the Revolution. Antoine Omer Talon is said to have thrown his own resources generously into the construction of the village, he planned for himself a hunting-lodge on an adjacent height—for even today the area is a favorite haunt of wild life In a miniature preserved in the family of a refugee, Talon wears the red robe of the French judiciary Contrary to local lore, he possessed no title to nobility.

The Articles of Agreement of the Asylum Company, formed in 1794 by Robert Morris and John Nicholson, Comptroller-General of Pennsylvania, to back the refugees, printed in a small 5" x 8" booklet with marbled paper cover, and revised in 1795 and 1801, have been preserved In the Minutes of the Assyhum Company (as the first secretary spelled it), preserved in the Congressional Library, Louis de Noailles is listed as one of the four managers, while Talon is set down as agent, at a salary of three thousand a year Noailles never established residence with the colony. When the news came of the death on the guillotine of



№ 184

Aſylum Company.

This is to certify, That

SIGNED

Preſident.

Secretary.

FIG 2 Share of the Asylum Company of 1794

his wife and other members of his family in the Paris Terror, he went into business with William Bingham, living for ten years in Philadelphia and retaining an agency for the Asylum Company lands.

On one of the early pages of the minutes, a meeting was scheduled for April 24, just 149 years ago, in the country house of Mr Morris (an estate said now to be part of Fairmount Park) In this country house, Morris was later to barricade himself against the sheriff, when the Bank of London suspended payment and the resultant reverberations ran round the world, forcing many Americans into bankruptcy.

Morris and Nicholson put a million acres of wild lands into the Company as capital, each share representing 200 acres, held at two to three dollars an acre One of the printed shares hung framed in Independence Hall near the Liberty Bell a number of years ago Two large ones are in the Tioga Point Museum collection (fig. 2), as are also an early account book and numerous receipted bills Among the latter is one carrying Talon's endorsement in firm clear characters The paltry sum of 10 pounds 4 shillings is all that is involved in this slip of paper But Talon's name on another fragment found in the secret cupboard of King Louis at the time the Tuileries were sacked in 1792 nearly cost the ex-judge both his head and his fortune For that fragment carried a rash offer to arrange the escape of the King from Paris, if not from France, where Jacobins wished him held as hostage against the threat of invasion by his emigrés brothers and their Austrian allies The Azilum fragment is a carpenter's account, containing a reference to the building not only of a bakery, but of *La Grande Maison* This brings us to another chapter of the story.

II

Just to one side of the town plot, on the river, colony agents prepared an 84-foot hewn-log house, no palace, but a well-planned and executed mansion, the ground plan of the great drawing-room of which has been preserved, along with the design of the exterior This was known in the early nineteenth century as the Queen's House (sometimes called by ignorant workmen the King's House) According to tradition, *La Grande Maison* was designed for the reception of Marie Antoinette and her two children, the Dauphin and his older sister Elizabeth, the only survivors of the group of four shown in the famous painting by Vigée Le Brun A portrait of the Queen alone, preserved by a loyal member of the colony, John Keating (fig 3), founder of the well-known Wilmington and Philadelphia family, carries the legend in gold letters, "Belle sur la trône, Grande sur l'échafaud" This was loaned several years ago to the Philadelphia Museum of Art[*]

Long before the retreat in the wilderness was completed, all plots to remove the remnants of

FIG. 3. John Keating.

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[*] J. Percy Keating. John Keating and his forbears. *Records Am. Catholic Hist Soc.* 29 (4), 1918.

the royal family from their Temple prison had failed, and the guillotine had terminated the career of the Queen Mother. Months elapsed, however, before the news reached Philadelphia, for England and France were at war, and privateers—an ocean wolf-pack, forerunners of the submarine—infested all the sea lanes of the Atlantic

III

Many names familiar to the historian are on the roster of the Pennsylvania colony Among them is that of Captain Denis Cottineau, fellow-commander with John Paul Jones in the latter's famous brush with the British on the English coast There has come down to us a fine portrait (fig 4) from the hand of the self-taught refugee, Fevret de St-Mémin,[6] who learned engraving from the encyclopedia to support himself in exile, devising a physionotrace and a pantograph to record exactly the profiles of all the distinguished characters of the decade (Copies of more than 200 are preserved in the Corcoran Gallery.) Cottineau was a large share-holder in the Asylum Company, but, like Noailles, appears to have preferred residence in Philadelphia. A fiery-tempered Breton, with positive ideas as to how the company should be run, he appears to have been at times a thorn in the flesh to its managers.

The name of another notable naval officer is associated with the colony, that of Captain Aristide du Petit-Thouars, one of its early agents

Fig. 4. Captain Denis Cottineau (Portrait by Fevret de St-Mémin)

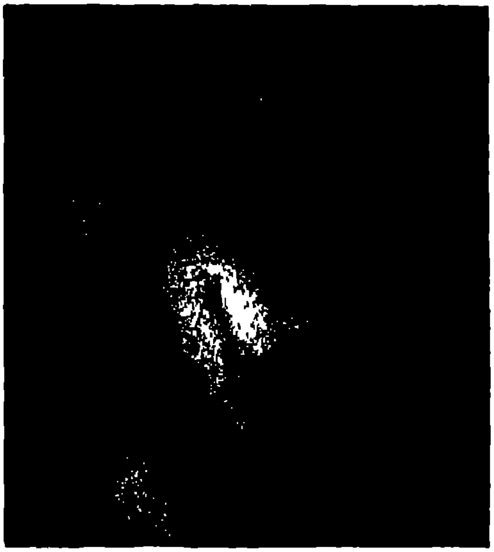

Fig 5 Captain Aristide du Petit-Thouars (1760-1798) and his sister Félicité (1765-1855)

A spirited and romantic character, he is shown in a family portrait (fig 5) with one of the twin sisters for whom he labored to prepare a retreat in the woods, 20 miles back from the river (Dushore today) Félicité preserved her brother's letters and journals, the publication of which has been lately completed after more than a century's delay[7] Aristide also had a delightful botanist brother, Aubert, worthy to rank with John and William Bartram, but marooned for the duration in the Indian Ocean on Île de France, whose orchids and other flora absorbed his attention till the tumult of the Revolution passed

An old schoolmate of the captain's, the Duke de la Rochefoucauld-Liancourt, another devoted royalist who had vainly offered to extricate King Louis from the clutches of the Paris mob, visited the colony in 1795. Forced to flee for his own life, the duke, known to your Society as an economist and philanthropist, sojourned for a number of months in Philadelphia, where he found a special welcome in the Chew mansion Part of the somewhat somber but absorbing private diary he kept here has appeared in French periodicals.

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[6] J. H. Morgan. The works of M. Fevret de Saint-Mémin. *Brooklyn Mus. Quarterly* 5: 10, 1918.

[7] Bergasse du Petit-Thouars. *Aristide Aubert du Petit-Thouars, héros d'Aboukir, lettres et documents inédits.* Paris, 1927

The entirety is promised us some day in an American edition [8]

In 1795, in the month of May, the duke set out on his travels, gathering impressions of the country for his 8-volume *Voyage* published in 1799 by Du Pont Journeying on horseback up the Susquehanna, he stopped two weeks at Azilum with an old friend, the Marquis de Blacons, turned storekeeper in exile (The marquis was one of eight for whom Jefferson gave a final dinner, at Lafayette's request, shortly before leaving Europe) Liancourt's map shows Asylum and the Loyalsock, a stream emptying into the West branch of the Susquehanna, along whose course the Asylum lands interlocked with or overlapped those of Joseph Priestley. The 20,000-acre clearing in the maple sugar zone entered on this map was probably a departure from the duke's customary caution and veracity. Much of this area is still heavily wooded today During the duke's stay at Azilum, the residents drew up a petition for a school, roads, and blooded stock for their farmlands, undoubtedly at his instigation He was a friend of the English agriculturist, Arthur Young, and had introduced many improvements on his estate in Normandy

In the picturesque region along the Loyalsock, a mountain trout-stream foaming over boulders between heavily timbered ridges and knobs that rise 2,000 feet above the valley, an agent of the colony, Charles Boulogne, met his death in 1796, in a whirlpool swollen by midsummer thunderstorms A certain suspicion of foul play hangs over the incident One of the first acts of the Asylum Company had been to cut a post-road through the wilderness toward the West Branch to shorten the route to Philadelphia Near this point, known today as Hillsgrove, the French road merged with the older Wallis pack-horse trail to Muncy Boulogne, returning at nightfall, mistook a candle high in John Hill's cabin window for the accustomed light at the ford, and spurred his horse over the bank into the pool His body and a few of his papers were recovered, many company documents are said to have been lost. He was buried in an unmarked grave. Crude triangular stones in the same tiny churchyard today indicate the resting-place of the Hills.

In 1798 there came another traveller in exile, Comte Colbert de Maulevrier, whose journal [9] with its water-color sketches of scenes along the way was edited with notes in 1935 by Chinard. Maulevrier's river views are more alluring than his unflattering self-portrait, showing a cadaverous man and horse and dog, suggestive of Ichabod Crane or the lean Knight of the Windmills Among his sketches is the Northumberland home of Joseph Priestley, in its mountain setting The comte visited Azilum also, recording somewhat dismal impressions of the outward scene, with girdled trees still standing He reports, however, an interesting social group holding nightly musicals in *La Grande Maison*, having somehow succeeded in transporting a piano hundreds of miles into the wilderness What they sang and played—Mozart, Gluck, Scarlatti, airs from Grétry's *Richard Coeur de Lion*—surely not "Ça ira," or the "Carmagnole," is still an object of research

IV

What remains of the colony today? The titled colonists returned to France when the Reign of Terror passed and the Napoleonic regime appeared to offer stability A number of the bourgeoisie remained, however, intermarrying with local families, and spreading out over the countryside. The widow d'Autremont and two sons remained in America, one son going back in the wake of Talleyrand, another distinguished visitor at the colony Le Fevres, Prevosts, La Portes, and Brevosts settled permanently in the vicinity, one of the group advertising in 1801 the opening of a school for teaching French, "a language which has become the common tongue of Europe, and which sincere friendship between the American and French people will render necessary to young gentlemen who intend to follow the political or merchantile life"—an admonition worth reviving

Charles Homet and his wife, formerly of the royal entourage in the Tuileries, were among those who remained, their sons and grandchildren farming the countryside across the river, giving their name to Homet's Ferry, and building a great gristmill with race and water-wheel. A portrait of Charles, Jr., whose fine open countenance is said to closely resemble his father's, has been preserved. Teachers, physicians, musicians, are among his descendants.

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[8] Samuel Breck, in a manuscript in the Society's Library, has left us a vivid sketch of this first gentleman of the extinct Versailles Court, living in poverty in an obscure alley "with only his ten fingers as servants."

[9] Colbert de Maulevrier *Voyage dans l'intérieure des États-Unis et au Canada, fait en 1798, Part 1, Voyage sur les bords de la Susquehanna*, pp. 12–13, and *Part 2, Voyage au Niagara et au Canada*, pp. 33–34 (Ed. by Gilbert Chinard.) Baltimore, 1935. (The edition is illustrated with 20 reproductions of the water-color sketches made by the journalist en route from Philadelphia to Harrisburg and Sunbury, and from Burlington to Wilkes-Barre and Niagara.)

What remains of the village site itself, so carefully plotted and laid out in 1793? Azilum terrace today is largely farmland, with scattered homesteads clustered about a white-steepled church, with a frieze of fleur-de-lis below the belfry. Locally it carries the name of Frenchtown. The Queen's House is gone, but just off its site stands the hundred-year-old homestead of the son of an emigré, John La Porte. When the others withdrew, the affairs of the colony were left in the hands of his father, Barthélemy, who had married an English girl said to have been of the same stock as Benjamin Franklin. John La Porte became in turn judge, Speaker of the House in the State Legislature, and congressman, foremost in the development of improvements in this section. In the gable of his country residence (he built a second home in the county seat, Towanda) there is a small palladium window in the gable, similar to that in the façade of Monticello). Both the elder La Portes were ardent Jeffersonians.

Back on the upland where Captain du Petit-Thouars started his clearing, a little stone Gothic church (St Basil's) looks down on Dushore (Du Thouars). A dozen miles farther back is the county seat of Sullivan, perched on a mountaintop near Eagle's Mere and named La Porte for the son of the refugee, who was state surveyor when the new county was laid off. The original plan recorded in the county deed-book is a replica of that of Azilum, and reminiscent of Philadelphia, with a central town lot, Spruce, Cherry, Beech, and Maple Avenues, and Raspberry, Blackberry, Strawberry, and Cranberry Alleys.

A few miles way in 1854, a rag-picker and mystic from Philadelphia deeded four square miles to the Almighty, and planned a religious colony, Celesta. Grasping county officials frustrated his design by selling the settlement and its flocks for taxes. It is interesting to note that at one time Peter Armstrong, for such was the name of the mystic, carried on a flourishing traffic in maple sugar, in the French tradition.

In 1793 the refugee St-Mémin had tried his maiden hand on a set of engravings for "a proposed French settlement on the Susquehanna" (now in the Corcoran Gallery). Many years later a Napoleonic exile, Piollet, a prominent canal and railway official in Bradford County (offshoot of old Luzerne), appears to have used the design for his spacious family residence in the town just north of Azilum, Wysox, where the North Branch Canal, promoted largely through French influence, had a depot. East and west along the Pennsylvania border, as far as the Delaware and Allegheny Rivers, Smethport, Coudersport, and Le Raysville perpetuate the names of the French and Belgian capitalists through whose enterprise this section was developed. Le Raysville is named for Le Ray de Chaumont, French business man and friend of John Paul Jones and Benjamin Franklin, interested in this section through the influence of Robert and Gouverneur Morris.

Finally, in a town 30 miles up the river, a La Porte descendant was instrumental in 1897 in securing the gift of a fireproof building for the local historical society, where many of the Azilum documents are stored and exhibits and publications keep alive the memory of the colony.[10] Greek pillars, the taste for which Jefferson brought back from France, dignify the façade, in harmony with the Greek name of the town, Athens. The town library is housed on the ground floor, Tioga Point Museum on the second.

Yet superficial commentators still maintain that the colony of Azilum has vanished, leaving not a wrack behind.

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[10] Elsie Murray *Azilum, French refugee colony of 1793* Athens, Pa., 1940

BEN FRANKLIN'S MORTGAGE ON THE DANIEL BOONE FARM

J. BENNETT NOLAN
Lieutenant Commander, U. S C G. R. (T)

(*Read November 21, 1942*)

Of all men saving Sylla, the man-slayer
 Who passes for in life and death most lucky
Of the great names which in our faces stare
 The General Boone, back-woodsman of Kentucky
Was happiest amongst mortals anywhere
 For killing nothing but a bear or buck, he
Enjoy'd the lonely vigorous harmless days
 Of his old age in wilds of deepest maze

Byron's *Don Juan*
Canto 8, couplet 61

THIS account of the hitherto unknown episode of a mortgage loan placed by Benjamin Franklin upon the farm in Berks County where Daniel Boone was born and brought up is better understood after a brief consideration of Boone's boyhood years.

The Pennsylvania Historical Commission, which has acquired the Boone tract as an historical shrine, is now engaged in restoring the homestead of two centuries ago. This project is one of national appeal and interest, since no figure in our early history has so completely captured the popular imagination nor does any command so engrossing a share in the admiring regard of our youth So compelling was the magic of the Boone tradition at a period when the average European conception of America was vague that it arrested the attention of the great Byron, then compiling the epic of Don Juan in his Venetian harem. The eight lines which the poet devotes to our hero do not rank as his best from the point of view of rhetorical cadence or even of a knowledge of his subject, but, after all, no other contemporary American can claim a similar tribute.

It is probable that many who read in the public press of the establishment of this Memorial Cabin are surprised at its location So much is the career of Daniel Boone linked with Kentucky and our southwestern frontier as it existed before the American Revolution that few realize that the pioneer spent his first sixteen years in the Schuylkill Valley of Pennsylvania.

It was in April of 1750 that the arrangements for departure were finally concluded and the wagons loaded for the long journey over the mountains to Virginia. At the head of the foremost ox-team stood a stalwart stripling taking his last look at the Oley hills silhouetted in the spring sunrise. As he gazed, he may well have speculated as to just how much the development attained in these sixteen years spent in Berks County was to influence his future life

Certainly there was little in his youthful Pennsylvania career to suggest the dazzling future which awaited him beyond the savage Appalachians. The gentle Quaker upbringing of Exeter Meeting seemed no more likely to rear a resourceful and formidable warrior than did the peaceful routine of the monotonous, agrarian, Palatine settlement to develop a leader of men, the savior of a border civilization. And yet, as the homely caravan wound its way down the Owatin, a glorious Destiny marched with the plodding oxen Daniel Boone's boyhood in Berks County was concluded, his career as a world figure was just begun.

The countless biographies, including the last most excellent effort of Captain Bakeless, have necessarily not had the space to treat any period of Boone's life in the detail permitted by this brochure Some years since the writer heard a student inquiring of that eminent historian and teacher, John Bach McMaster, why he did not write a history of Pennsylvania. "Because it has not been sufficiently monographed as yet," replied the sage. Perhaps when the great particularized life of Daniel Boone comes to be written, it will be founded upon recitals similar to this, dealing at length with scattered episodes in the career of the distinguished subject.

This episode in the boyhood of Daniel Boone would naturally interest all Americans, but at first glance would hardly seem relevant to the routine or aims of the American Philosophical Society. However, when, somewhat unexpectedly, this youthful career of a great pioneer begins to dovetail with that of our Avatar, Ben Franklin, it becomes of interest to this Society and should be deemed worthy of perpetuation in its records.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 5, MAY, 1944

The narrative which shall follow is important, first, in that it shows Franklin in the unwonted role of trustee of an insurance company, lending money upon land, and, secondly, in that it affords another demonstration, if such were needed, of his innate good-will and loyalty toward a boyhood friend.

The genesis of our anecdote lies in the incredibly bad husbandry of Squire Boone, Daniel's father. When Squire came over from Devon and pushed up through the present Bucks County to patent a piece of land in the present Berks County, he was a weaver and not a farmer. He reclaimed the tract from the forest and erected a log dwelling thereon, but he is not likely to have improved it in the seventeen years of his tenure. Nor was the tall, active, sinewy lad, christened Daniel, and sixteen years old when the family left for Virginia, apt to have been a useful farmhand; he was more interested in fishing, trapping, and field sports. So, in 1750 when Squire Boone, not too successful on his plantation and embittered by strife with the local Quaker Meeting, resolved to emigrate to Virginia, it was not easy to find a purchaser, and yet someone had to be discovered who would hold the bag

In this juncture Squire bethought himself of a relative by marriage, William Maugridge, of Philadelphia. He journeyed down the long Schuylkill trail, found Maugridge, and actually sold him the 158 acres for £300 Pennsylvania currency, the equivalent of £150 sterling[1] What blandishments the Squire employed or whether the grantee ever saw the farm before purchasing, we do not know Maugridge did not even take the trouble to record his deed, but he came up and began to work the land, probably with the aid of negro slave labor[2]

Maugridge's background had scarcely qualified him to rehabilitate a farm, sadly run down. We know little of him beyond the fact that he was one of Franklin's earliest Philadelphia friends and associates, had been a member of the Junto, was a joiner by trade, and is described in the *Autobiography* as an "excellent sensible man." Very few of his autographs survive, the only one in the extensive collections of the Historical Society of Pennsylvania being his attestation as Sheriff's Clerk of an election October 2, 1749.[3]

Affairs did not prosper with Maugridge, indeed it was not likely that they would, for he was not fitted for a pioneer farmer's life in the wilderness of the upper Schuylkill. Four years elapsed, and the winter of 1754 found our amateur farmer very much in debt He rode down to Philadelphia just as Squire Boone had done before him and discussed his predicament with his old friend and advisor, the printer Ben Franklin. He arrived at a propitious moment, since Franklin, two years before, had organized his Philadelphia Contributionship for the Insurance of Houses from loss by Fire, and the Contributionship had funds to invest. To be sure, a loan on partially unseated lands in the new county of Berks was not an attractive investment and without Franklin's personal endorsement was not likely to be considered However, Ben Franklin was never the man to leave an old friend in distress, and now we relegate ourselves to the minutes of the society

Minutes of February 5, 1754

> Application being made on behalf of William Maugridge to borrow two hundred pounds as a Security for which he proposes to Mortgage his Plantation containing   Acres in the County of Berks, and the Board being informed that Benjamin Franklin will engage that the interest shall be punctually paid, Agreed that John Smith may let him have it out of the first money he shall have in his hands and that Hugh Roberts is appointed to assist the treasurer in Examining the Title

Whether Hugh Roberts ever performed the duties delegated to him and made the toilsome trip to Reading, newly erected county seat of Berks County, to examine the title, is not disclosed, but had he searched the records, he would have found that Maugridge had not yet recorded his deed and that consequently the Contributionship's mortgage for £200, placed April 10, 1754,[4] was not a lien.

Now nine years passed and much water went over the dam. The French and Indian War raged, Braddock was defeated, the English were finally victorious, and Ben Franklin went to London as Colonial Agent in 1757 During all this eventful period Maugridge stayed on the farm, trying to make ends meet with the £200 which Mr. Franklin's recommendation had procured for him. By the autumn of 1762 he was again in financial stress. Franklin was now back in Philadelphia for the two years of interlude between his second and third visits to Europe. Again Maugridge rode down the valley trail to consult with his early associate. Franklin could scarcely suggest to the Contributionship the placing of an additional mortgage on the Boone plot when the first one had not been paid. Indeed, it is likely that according to his guarantee he had personally advanced installments of interest which the luckless mortgagor could not promptly pay. It is here, however, that we have evidence of his philanthropy towards a member of his beloved Junto. On December 9, 1762, he gave Maugridge an additional sum of £258 16s, taking as security a second mortgage to himself.[5]

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[1] Deed Boone to Maugridge, Berks County records, Deed Book No. 6, page 1

[2] Maugridge's will, Berks County records, Will Book 2, page 16, mentions these slaves.

[3] Hist. Soc. Pennsylvania records.

[4] Berks County records, Mortgage Book AA, page 68.

Franklin went back to the fleshpots of Craven Street, and poor Maugridge continued with his agrarian struggles. That he was not unmindful of the benevolence of the Franklin family and occasionally sent them good cheer from Berks County, is shown by Deborah Franklin's letter to Benjamin on November 3, 1765.[6] "Speaking of buckwheat cakes, our good friend Mr Maugridge has sent some of the best of the flour that I ever saw and we had them hot." This demonstrates that if the mortgagor was not always punctual in his payment of interest, he was, at least, not insensible to the favor which had been conferred upon him.

Maugridge had one gleam of comfort in his declining years, when his daughter Sarah contracted an advantageous marriage with Edward Drury, a well-to-do innkeeper of Reading. With Sarah's removal, however, he was compelled to work the harder, and finally in 1766 he gave up the unequal struggle and died. The news soon permeated to Deborah in Philadelphia and she wrote to her husband under date of April 26, 1767.

> When I heard of Mr Maugridge's death it surprised and troubled me indeed. Our neighbor Thomson went up. I got him to speak to Mrs. Drury. She seemed to be a stranger to the affair, but it could not be so as I had talked with her about it. I got Mr Thomson to write to her but I have not received one word of answer from her, but Tommy Potts says his brother, Rutter, is executor and he will speak to him.[7]

At the time of his passing Maugridge must have been considerably in arrears on the mortgage of the Contributionship, for by minute of December 2, 1766, the Board, referring to "sundry persons backward in paying interest," appointed a committee "to do what may be necessary in the affair of William Maugridge's interest."

The lawyer in charge of the Contributionship's affairs at this period was the celebrated Thomas Wharton. Maugridge was now dead, and Squire Boone's former farm had passed under the Maugridge will to Sarah Maugridge Drury. Both the mortgages, the one to the Contributionship and the one to Benjamin Franklin, were in arrears, something had to be done. Inasmuch as the Franklin lien was the secondary one and as Benjamin had practically guaranteed the Contributionship loan, the most logical thing seemed to be to consult with him. But Benjamin was now in London, and one must reckon with the delay of perhaps six months before an answer could be procured. Then Wharton recalled that the Franklin business matters were being handled by Deborah Franklin under power of attorney, and addressed himself to her. From a practical standpoint it was perhaps better that the Philosopher was not personally in Philadelphia, since in the goodness of his heart he was likely to condone his own debt and perhaps pay that of the Contributionship. Deborah was made of sterner stuff and directed Wharton to proceed for collection.

Just here there enters into our narrative still another notable figure, that of the young Caledonian lawyer James Wilson, who had come over from St. Andrews and begun to practice in the frontier town of Reading. Wharton had no idea of entrusting his precious person to the rigors of a cold winter ride or his stomach to the unbelievably bad fare of the Reading taverns. On October 14, 1768, he drew a power of attorney whereby Deborah Franklin, acting for "My husband late of Philadelphia, now of London," empowered James Wilson, attorney-at-law of Reading, to collect the Maugridge mortgage.

When James Wilson, destined to be a signer of the Declaration of Independence and to rank as one of the greatest of our earlier interpreters of the Constitution, received the claim, it probably did not look too hopeful. Besides the farm there were not even enough assets in the Maugridge estate to warrant the filing of an account, although the will bequeathed some slaves. Wilson's first act was to record the deed from Squire Boone, which had lain unrecorded ever since the

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[5] Berks County records, Mortgage Book AB, page 150.

[6] Bache Collection, American Philosophical Society.

[7] Bache Collection, American Philosophical Society.

Squire rode down the trail for Virginia eighteen years before Had Maugridge's subsequent creditors been alert enough, they might have barred both the Contributionship and Franklin from their priority of lien. One hopeful circumstance for James Wilson's chance for collection lay in the fact that Sarah Maugridge Drury was now a person of means Her husband had died, leaving her a tavern stand which must have been a prominent one, since the first meeting for the establishment of a library in Reading was held there

Whether Sarah personally paid up the overdue interest is not disclosed, but this much is certain she miraculously found a purchaser, one Henry Feree, who on November 21, 1768, was willing to give £900 for the farm which the Boones sold to Maugridge for £300 in 1750, although one reason for this advance may be found in the fact that Pennsylvania exchange had dropped in the interval

So the unexpected had happened, James Wilson satisfied the mortgage, and Deborah could reassure her Benjamin over the fortunate ending of his quixotic loan This, it would seem, would have been the time for the collection of the first or Contributionship mortgage That the directors of the insurance company were concerned for the liquidation of the loan is shown by their minute of January 6, 1767, after lawyer Wharton had reported that Maugridge was dead. In this minute he is directed to continue for collection and yet, curiously enough, the debt was not paid nor the mortgage satisfied until 1772 Another distinguished attorney-in-fact, Edward Biddle, Speaker of the first Provincial Congress, also practicing law in Reading at the period, made final satisfaction of this protracted matter, all of the parties to this transaction seem to have been people of prominence.

Thus ends our modest saga of Daniel Boone's farm, of joiner Maugridge's hapless agrarian experiment thereon, and of Ben Franklin's gallant effort to retrieve the tottering fortunes of an old friend To those who may regard the episode as a trivial one, the compiler can only plead the importance of the personages involved It is with the aid of sidelights such as these that real history is evolved, just as a man's innate characteristics are more often revealed in the inventory of his effects than in his public utterances

Without Franklin's name as mortgagee and but for the circumstance that a great pioneer was born upon the premises, the recital of the debt upon an obscure up-country farm would have little significance And yet it is well the incident has been resurrected, it is proper that the American Philosophical Society should give its narration a place upon their program It affords new spontaneous testimony of that essential good-will without which no one can rank as truly illustrious.

Most eminent men have in their time been reviled, not even excepting the gentle Nazarene carpenter, son of Joseph and Mary There have been cavillers to insinuate that Benjamin Franklin was self-seeking, even avaricious If any proof is needed to show the fallacy of such aspersions, it may be evoked from a perusal of this essay.

WYNICACO—A CHOPTANK INDIAN CHIEF[1]

C. A. WESLAGER

The Archaeological Society of Delaware

AT least one United States president—Thomas Jefferson—was not indifferent to the opportunities of ethnology of his time and locality. Not only did he carry out one of the first archaeological excavations on record in the nation, at Monticello, Virginia, but, at his instigation, collections of linguistic data and some accounts of customs were made among contemporary Indians. While these surveys were unsystematic, according to modern standards, nevertheless, as in the instance about to be described, they are a distinct contribution to knowledge.

In 1792 a band of Algonkian-speaking Indians was still living in the vicinity of Cambridge, Maryland, on the Eastern Shore of Chesapeake Bay. On September 18, 1792, Dr William Vans Murray, a Cambridge physician, wrote to Thomas Jefferson, describing these Indians. There were nine left in the band, one of whom, a Mrs Mulberry, was called the "queen" and was described as the widow of an Indian known as the "colonel" The nine Indians were living at a place called Locust Neck on the headwaters of the Choptank River

Dr Murray also transmitted a vocabulary of the tribe now preserved in the archives of the American Philosophical Society in Philadelphia, which was published by Brinton.[2] It was later examined critically by Speck[3] and augmented with Nanticoke words gathered from Canadian sources.

On the margins of the manuscript, there are two longhand notes in Murray's writing, which are of immediate interest. The first is as follows:[4]

> Wynicaco—the last king crowned of the Nanticoke tribe, he died as past 80 years since. His body was preserved and very formally kept in a *Quacasun-house—chio-ca son* house, 70 years dead.

The second marginal note is no less interesting:

> Taken at Locust-Neck Town—the remains of an ancient Indian town on Goose Creek, Choptank River in Dorset, Maryland—Five wigwams and a board house with a glass window now form the whole that is left of the Nanticoke tribe, wh [*sic*] was an hundred years since, numerous and powerful—many of them migrated to the Six Nations about twenty-five years since. Their words were principally taken from a squaw called Mrs. Mulberry—the widow of the late chief—who was called Colonel—*no king having succeeded their famous Winshako who died 75 years since*

Wynicaco, whom Murray pronounced a Nanticoke Indian, has been frequently mentioned in ethnohistorical literature, and Murray's definition has been accepted without further delineation Brinton[5] speaks of Wynicaco as the "last head chief or crowned king of the Nanticoke." Speck[6] comments on the similarity of the name

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[1] Many of the citations regarding Wynicaco which appear in this paper were first uncovered by William B Marye. These are included in the appendix of his paper, "The Choptank Indians," *Bull Archaeol. Soc. Delaware* 2 (5), 1937 It was a review of these data which prompted the present writer to reexamine the original sources in the preparation of this paper. I want to acknowledge Mr. Marye's work and give him the credit which he fully deserves.

[2] D G Brinton, "A Vocabulary of the Nanticoke Language," *Proc. Am Philos Soc* 31: 325–333, 1893.

[3] Frank G. Speck, *The Nanticoke and Conoy Indians.* Hist Soc. Delaware, Wilmington, 1927.

[4] See Speck, *op cit.* 41, for the excerpts quoted and a copy of Murray's complete letter to Thomas Jefferson.

[5] D. G Brinton, *The Lenape and Their Legends* (Philadelphia, 1885). 24.

[6] Speck, *op. cit.* 12.

Speck also mentions Wynicaro in *The Nanticoke Community of Delaware*, p. 7 (Mus. Am Indian, Heye Foundation, New York, 1915), and also in *Indians of the Eastern Shore of Maryland*, p. 9 (Eastern Shore Soc., Baltimore, 1922).

Other references to Wynicaco which have come to the writer's attention occur in Francis Jordan, Jr., *Aboriginal Fishing Stations on the Coast of the Middle Atlantic States*, p. 31 (Philadelphia, 1906); D. S. Davidson, "Burial Customs of the Delmarva Peninsula and the Question of their Chronology," *Am. Antiquity* 1 (2): 86, 1935; W. C. MacLeod, "Priests, Temples and the Practice of Mummification in Southeastern North America," *Inter. Congress Americanists, 22nd Session, Rome, 1926*, p. 209; L. P. Bowen, *The Days of Makemie* (Philadelphia, 1885); *Bur. Am. Ethnol. Bull.* 30.

All of these writers name Wynicaco as the last *Nanticoke* chief, king, or emperor

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to that of a Conoy chief of 1777 called Wilakuku, and says that the close etymological resemblance is "significant and testifies to the political unity of the Nanticoke and Conoy " The resemblance in the forms of the names given in the records is based upon the interchange of *n* and *l*, a characteristic of the phonetic variation of Algonkian tongues

New data, taken chiefly from the Maryland archives, reveal hitherto unknown facts relative to Wynicaco and add to knowledge of the precursors of the Indians on the Choptank River visited by Murray in 1792. Marye[7] included a few of these references to Wynicaco in a discussion of burial customs of the Maryland Indians

A few prefatory remarks are in order, so that Wynicaco's position and relationship with the Indians called Nanticokes may be clarified There were a number of separate tribal communities on the Eastern Shore of Maryland during the protohistoric period[8]

Of these Indian communities, one on the Nanticoke River, consisting of a number of villages, was the largest The inhabitants of this river and its tributaries were known as Nanticoke Indians, and the use of the name Nanticoke was restricted exclusively to them by the Marylanders.

A near-by community on the Choptank River is one with which we are now concerned In the seventeenth century there were at least four Indian towns along the Choptank River and its tributaries.[9] The occupants were called Choptank Indians and treated by the whites as distinct from the Nanticoke The Indians living in the three largest Choptank towns were also known by the names of their respective town chiefs: Ababco's Indians, Tequissino's Indians, and Hatsawap's Indians

The Nanticoke Indians, *i e* , those living on the Nanticoke River, looked to their own great leader whom the English termed the "Nanticoke Emperor " Four of these emperors are named in the records. Unnacokasimmon ruled in 1668 He was succeeded by his brother Ohoperoon. It was thought by some that Unnacokasimmon had been poisoned by his subjects because he was too friendly with the whites The Nanticoke had a reputation as poisoners, we must remember The succession from Unnacokasimmon to his brother may indicate matrilineal progression, a characteristic of the Powhatan confederacy

After Ohoperoon's death, white influence was strongly brought to bear, and a new emperor, practically selected by the English, was Panquas, also called "Captain General and Commander in Chief " Another Indian, Annoughtought, was appointed "Second and Assistant in the Rule " Later, an Indian named Felton was appointed Emperor[10] Wynicaco, alleged to be the last king or emperor of the Nanticoke, is not mentioned, and it is clear that his sphere of influence lay on the Choptank River, and not the Nanticoke, as confirmed in the following citations[11]

On January 15, 1702, Wynicaco sold land on the Choptank River to one John Kirk He is described on the deed as "Winacaco, otherwise called Cnocknatoone, Ruler and King of the Abapco Indians "[12]

On August 13, 1704, "Wynicaco called Onoocknatoon Ruler and King of the Abapco Indians and Noochyousk and Patchyonoke Ruler of the Hatswampt Indians and Patchyeuse Ruler of the Tequassino Indians"[13] also sold land to the whites

Thirty-one members of the three bands ratified the transfer of the land, and their names give us an interesting record of the Choptank population of that day[14]

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[7] William B. Marye, "Former Indian Sites in Maryland as Located by Early Colonial Records," *Am Antiquity* 2 (1)· 40–46, 1936.

[8] The writer discussed these tribes in "Indian Tribes of the Delmarva Peninsula," *Bull. Archaeol. Soc. Delaware* 3 (5): 25–36, 1942. It must be remembered in connection with this paper that the Nanticoke, Choptank, Assateague, Pocomoke, and other tribal groups were considered as separate entities by the Maryland colonial authorities. Nevertheless, the term "Nanticoke" has been subsequently used carelessly by most writers as applied to all of these distinct tribes. This generic use of Nanticoke is to be deplored, since it has clouded the question of identity

[9] For a description of these towns, see Marye (*Bull. Archaeol. Soc. Delaware* 2 (5), 1937)

[10] The writer has substantiated this progression of emperors, and the series of references need not burden this paper However, Raphael Semmes in *Captains and Mariners of Early Maryland*, pp 397, 399, 401 (Baltimore, 1937), may be consulted for a summation of data

[11] William Russel Clark, late Chief of the remnant "Nanticoke" on Indian River in Delaware, adopted this name but misspelled it Wyniaco.

[12] Dorchester County Land Records, Deed Book No 6 (old), 1702–1716, Folio 5 (Marye (1937, 6) quotes deed in full).

[13] *Ibid* , Folio 47 (Marye (1937, appendix 15) gives complete deed)

[14] The names of the Indian signers are as follows George Attowcase, Queen Nehahcash, Tockowsh, Towcosh, Armstrong, Abquasllow, Pushshecks, Mr William Ahconepatomach, Old Tom Tischouse, Annahenkows, Cuttyousemous, Weancenapush, Tesse, Aheatimousko, Chaquanouske, Neckapasounke, Ahcatowin, Kehowh, Wapatown, Ohkeapattam, Pequscatun, Ahigmante, Ahiewasuske, Am-

It is important that the above deed established Wynicaco as Ababco's successor, Noochyousk and Patchyonoke as successors to Hatsawap, and Patchyeuse as a successor to Tequissino

Another documentary reference to Wynicaco is found March 9, 1705, when he sold land on the Choptank River in company with the three other chiefs to William Seward [15] The deed describes him as "Winnicaco otherwise called Ocoocknatoon, Ruler and King of the Abapco Indians, etc "

On August 20, 1704, land was leased to whites by "Weneghaco King of Ababco Indians and his queen," for forty matchcoats.[16] The queen was apparently Wynicaco's wife, and it is perhaps justifiable to assume that she was the Queen Nehacash who signed the earlier deed of August 13, 1704

On August 4, 1701, "Wimigaco an Indian King sonn to Ababco of Dorchester County" leased another plot of land [17] This reference is highly important, for it established Wynicaco not only as Ababco's successor, but as *his son*

As early as 1671, Ababco and his followers were known to have occupied a town near the mouth of Whitehall Creek, a tributary of the Choptank River [18] The Nanticoke, at this time living on the Nanticoke River, also had their own rulers, and this precludes the possibility of Ababco having exercised control over them Furthermore, the Emperor of the Nanticoke exercised little hegemony on the Choptank, for Ababco told the Maryland authorities that the Nanticoke Emperor had asked him to join in a war against the English, but he had declined to participate [19]

The records also reveal that Ababco had another son named Netaughwoughton [20] He also had an unnamed daughter, sister to Wynicaco, who was taken into captivity by the "northern Indians," presumably Seneca or Oneida, about 1683, and was later released with other Choptank prisoners upon the intervention of the provincial authorities.[21]

Wynicaco died between 75 and 80 years prior to Murray's visit in 1792, and this would place his death between 1712 and 1717. Consequently, between 1717 and 1792, one would expect to find his heirs named in the deeds, and the assumption is not unwarranted.

A deed was filed September 9, 1726, by "Betty Caco, Queen of the Ababoc Indians *daughter and heir of Winnecaco* late of Dorchester county deceased who was Ruller and King of the af d Ababoc Indians and Pametasuck Queen of the hatch Swamp Hatsawap Indians, Daughter and heir of Patchosk late of Dorchester County dec d who was Ruler and King of the af d Hatchswamp Indians, etc."[22]

This deed was ratified by eleven Indians whose proper names reveal an interesting transition from Algonkian forms to English [23]

Also on September 9, of the same year, the two "Queens" sold land to whites. The Indian women are referred to as Parmenta Sink (Pametasuck), Queen of the hardswamps, and Betty Carco, Queen of the Ababco Indians.[24] Twelve Indians signed this transfer with their marks.[25]

The earliest reference to Betty Caco is dated June 13, 1722, when she sold land in her own right, indicating that her father, Wynicaco, had died prior to that date [26]

Thus Betty Caco inherited rights to land which had belonged to her father Wynicaco and her grandfather Ababco Prior to Ababco, another Choptank chief, Tetacoughkow, is cited in the records of 1659 as signer of a treaty with Governor Fendall, wherein he represented the Indians of Transquakine (later called Ababco's town). He may have been one of Wynicaco's ancestors.

It is to be noted that Betty Caco's contemporary, Queen Pametasuck, inherited land that had

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mannusformes, Wecumoens, Mahenscaowes, Chocheknotal, Pummapus, Atequannsh, Keepecon, Woodenhocke. (An Eastern Shore town is named after the last-mentioned chief)

Many of these spellings vary in other deeds. However, the Algonkian word forms can be readily distinguished

[15] Dorchester County Land Records, Deed Book No. 6 (old), 1702–1716, Folio 87 (see Marye (1937, appendix. 16) for complete deed)

[16] *Ibid* , Folio 59 (Marye, 1937, appendix· 17)

[17] Dorchester County Land Records, Deed Book No. 5 (old), 1692–1701, Folio 214 (Marye, 1937, appendix: 18)

[18] Maryland Archives 51, 1671–72 71

[19] Maryland Archives 15 359

[20] Marye, 1937: 1, 6.

[21] Marye, 1937 6.

[22] Dorchester County Land Records, Deed Book No. 8 (old), 1702–1732, Folio 142 (Marye, 1937, appendix· 18)

[23] Their names are· Nanee Cabonke, widow Tatowin, Arquasuckanak, Tallowin, Six Pence, Weanchum, Permotasichah, Betty Caco, Tom Bishop, Dick, Bonny Clabbo.

[24] Dorchester County Land Records, Deed Book No. 8 (old), 1720–1732, Folio 142 (Marye, 1937, appendix: 18).

[25] Their names are as follows. Six Pence, Weanchum, Cabonk, widow Tatowin, Little John, Araquakanah, Tatlowin, Parmenta, Betty Carco, Tom Bishop, Dick, Bonna Clabbo.

[26] Scharf Papers, Maryland Historical Society.

belonged to her father, Patchyosk, who had inherited it from his father Tequissino[27]

Whether Betty Caco gave birth to offspring to perpetuate the blood of Wynicaco remains unknown. In the year 1748, twelve Indians who called themselves "Choptank or Locust Neck Indians" (note not Nanticokes) rented a plantation to Thomas Owen on the Choptank[28] One of the signatories was Mulbury, and this is the first time his name appears in the legal records[29] He, beyond doubt, was the "late colonel," husband of Mrs. Mulberry, of whom Murray speaks.

In 1742 the "Indian Mulberry of Locust Neck Town" testified that the Nanticoke Indians of Chicacone Town on the Nanticoke River had plotted with the Shawnee to rise against the English[30]

The next chronological reference to these Indians was that of Murray in 1792, already cited

On April 6, 1799, seven years after Murray's visit, there remained only five of the nine Indians he had observed, all bearing English names with no suggestion of their native nomenclature They were Mary Mulberry, her son Henry Mulberry, Henry Sixpence, Thomas Joshua, and Esther Henry Marye deduces from her name that Esther Henry may have had Negro blood[31] Mary Mulberry was undoubtedly the Mrs Mulberry of Murray and the wife of the "Indian Mulberry" called "colonel"

It seems that the strain has now been erased, having been last reliably observed by the historian Bozman at East New Market, near Locust Neck, about 1837.[32] The writer recently made a reconnaissance to Cambridge and vicinity and interviewed many elderly persons, both white and Negro, in search of descendants of these last five Choptank Indians.

Not a few colored persons living in East New Market today have non-Negroid facial characteristics. It is not uncommon to encounter a Negro with thin lips, aquiline nose, and wide zygomatic span, or to see another with straight hair and a light complexion It is tradition among the older Negroes that a long time ago some of their people married Locust Neck Indians None of the present colored population has sufficient Indian blood to be of significance racially, and, in fact, none interviewed made positive claim to Indian ancestry No one named Mulberry was found, and no trace of descendants bearing the names of other Indians cited in the documents.

CONCLUSIONS

The foregoing data reveal several items which are contributory to our understanding of the Algonkian-speaking Indians of the Eastern Shore of Maryland It has been shown that the writers who have called Wynicaco a "Nanticoke Emperor" or "Nanticoke King" have used both words very loosely Wynicaco resided on the Choptank River and was sachem of one of three Choptank Indian bands, named for his father, Ababco, who did not merit title to emperorship Wynicaco succeeded Ababco as the leader of the band, thus inheriting his father's chieftaincy

The national leader of the Nanticoke Indians lived on the Nanticoke River, and was known to the English as the Nanticoke Emperor He apparently had little or no jurisdiction over the Choptank Indians Wynicaco and the nine so-called "Nanticokes" of 1792 were not politically affiliated with the true Nanticoke tribe, but were remnants of the Choptank Thus the vocabulary collected by Dr. Murray and reprinted by Brinton, which has been accepted as illustrative of the Nanticoke tongue, must be reclassified as a Choptank vocabulary, at least until it is proved that both Nanticoke and Choptank spoke identical dialects, which is highly probable

We learn also that Wynicaco and other contemporary Choptank chiefs, and their predecessors, negotiated land sales without intervention by other Indians, thus exercising local autonomy on the Choptank River Land was sold by these chiefs with the common consent of their followers.

The succession of descent among the Choptank was seemingly patrilineal, and either a son or a daughter could inherit the father's position and land rights. Feminine right to "nobility," however, was recognized, and the names of four "queens" are recorded· Nehacash, Betty Caco, Pametasuck, and Mrs. Mulberry.

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[27] The English conception of land tenure prevailed in all of these sales. We are unable to find positive evidence of the family hunting territory as the basis of land ownership such as the writer has noted among the Delawares. (See C. A Weslager, "The Family Hunting Territory Question in Delaware" published by the Archaeological Society of Delaware, June 20, 1941)

[28] Maryland Archives 31· 44–45

[29] The signers were Hoping Sam, Abram, John Quash, Presillah, John Pike, Sarah Bishop, Nancy, Tom Bishop, Mulbury, Jamme, James Cohunk, and Thomas Owens

[30] Maryland Archives 28. 262, 266, 269

[31] Marye, 1937: 13.

[32] Marye, 1937: 14.

From a description of the mortuary treatment of Wynicaco's corpse, there is evidence that the custom of preserving the remains of a dead chief in a Chiacason House was a cultural trait of the Choptank.[illegible]

Through the legal records, from 1704 to 1799, the names of Choptank Indians undergo a gradual anglicizing, and the number of signers decreases In 1837 we have a contemporary observation of their status as of that year, and finally, the writer's recent field trip points to the conclusion that the blood of Mrs. Mulberry and the other Choptank Indians has been absorbed by the local Negro population.

[illegible] This burial complex was also characteristic of the Nanticoke, Assateague, and Pocomoke, see C A Weslager, "Ossuaries on the Delmarva Peninsula," *Am Antiquity* 8 (2) 142-161, 1942

AN INEXHAUSTIBLE SOURCE OF LINGUISTIC KNOWLEDGE [1]

ARTHÈME DUTILLY

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(Read November 21, 1942)

ACCORDING to the very kind letter of invitation from the executive officer, I am expected to say as a preliminary a few words about my travels in the Arctic regions and about the habitat or environment of the Eskimo which I have made my life study. To understand the life of the inhabitant of the Arctic, the Eskimo, we must know the country—its geography, its geology, its soils, its climate, its flora and fauna. And, it is not certain that the inhabitant is not also subtly influenced by such factors as polar radiations, winds, clouds and precipitation, the magnetic pole, and the aurora, or that these influences are less than that of the flora and fauna.

Since 1933 this region has been my assignment, and it has given me my life work. Every summer since then I have been collecting data on the Eskimo and his country. I covered 85,000 miles in the Arctic from Demarcation Point, Alaska, to South Greenland by schooner, motorboat, steamship, plane, and on foot, exploring 198 Arctic stations. At present I have more than 40,000 specimens of plants (Arctic cryptogams and phanerogams), rocks, minerals, soils, archaeological and anthropological specimens, insects, etc.

No science can be properly understood without knowing its history: likewise no region nor its people can be understood without knowing their history. I have therefore had to concern myself with the history of the natural sciences of the Arctic and to take account of what we owe to our predecessors in exploration. I soon ascertained that there is one class of explorers whose scientific work is rather modest but who have done an enormous amount of work in Indian linguistics. These are the missionaries. Incidentally, their works, having no other end in view than the service of their missionary profession, have had no circulation outside their own group, order, or congregation, and thus have not had in view the interest which learned societies might take in them. Many of their grammars, dictionaries, translations of the Bible, or other religious works have remained in manuscript or have been merely mimeographed for the use of their successors in their mission in the midst of such and such a tribe. In the oldest missions these manuscripts have served two or three generations of missionaries who have completed or corrected them in accordance with their increasingly accurate knowledge or with the development of the dialect. To catalogue all the linguistic works made by the missionaries from the beginning of the Canadian colony, whether under the French regime from 1604 to 1760 or under the English regime from 1760 to our time, would be the undertaking of a linguistic or missiological institute rather than of an individual.

Under the French regime practically all the tribes which then existed and those not yet extinct were evangelized either by the Recollects (1615–1796 (last survivor 1813)) or by the Jesuits (1625–1800 (last survivor 1800)) or by the Sulpicians and Secular priests.

Under the English regime, dating from 1710 in Nova Scotia, several Protestant churches entered the scene, such as the Anglican (Nova Scotia, 1710) and the Presbyterian (Nova Scotia, 1749), and after the fall of Quebec in 1760, these two denominations as well as the Congregationalists (1760), the Lutherans (1761), and the Methodists (1765) engaged in missionary activity throughout Canada.

A new period of Catholic missionary activity among the native tribes of Canada began in 1841 with the arrival in Montreal of the Missionary Oblates of Mary Immaculate.[2] A year later a group of Jesuit missionaries also arrived

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[1] Investigation aided by grants from the Penrose Fund of the American Philosophical Society.

[2] The Missionary Oblates of Mary Immaculate (O. M. I.). Founded January 25, 1816, by Mgr. de Mazenod, under the device *Evangelizare pauperibus misit me*. "He has sent me to evangelize the poor"—the Congregation of the Oblate Missionaries of Mary Immaculate now has almost 5,196 members—priests and brothers coadjutor—and is divided into 32 provinces and Vicariates Apostolic. Numerous *juniorates* (2,014 Oblate minor seminarians),

As for political geography, it must be remembered that from 1791 on, Canada had a threefold division namely, Upper Canada (Ontario), Lower Canada (Quebec), and the territories of the North-West belonging at first to the Hudson's Bay Company and afterwards becoming an integral part of the federation[3]

> This immense extent of the north, measuring formerly nearly 2,000,000 square miles belonged to the Hudson's Bay Company on titles, that were very much contested[4]
>
> The 8th of April, 1875, the territories were provided with an official constitution for all the North-West, formerly called Rupert Land In 1882, they were sub-divided into 4 temporary districts Assiniboia, Athabaska, Alberta, Saskatchewan Reconstituted on the 1st of September 1905, the territories actually comprise a surface of 1,309,682 square miles north of 60 latitude minus the Yukon In order to effectuate a more convenient plan of administration the territories which embrace all the portions of country not belonging to a Western Province were divided into 4 districts Yukon, Mackenzie, Keewatin, Franklin[5]

This is enough, I believe, to establish the outlines of the Canadian Indians.

The present population, largely of mixed blood, is roughly 110,000 When the Dominion was discovered, its inhabitants numbered only about 220,000, according to Mooney[6]

The map which you see localizes for you the various tribes which still exist in Canada. The figures appended to their names indicate the population. Most of these tribes were actually evangelized by the Oblate missionaries, and this is true not only of the Vicariates in charge of the Oblates, such as Prince Rupert, Yukon, Mackenzie, Grouard (Peace River), Le Pas (Keewatin), Hudson Bay, and James Bay, but also in the Dioceses where the Indians are chiefly on reservation, such as Chicoutimi, Quebec, Ottawa, St. Boniface, Winnipeg, and Regina

More than half the Indian population today is Roman Catholic, and it is served by the Missionary Oblates of Mary Immaculate, who have 200 of their members engaged in the care of the native tribes These missionaries conduct about 100 Indian schools and 15 mission hospitals. In addition, more than 40 Oblate priests are concerned with the evangelization of the Eskimo, and in connection with this work they direct two hospitals and one school

The other Christian Indians are served by the Anglican and Presbyterian missionaries with about 60 non-confessional schools Among all those who take care directly of the Canadian Indians, the Oblate missionaries have, perhaps more than any other group, acquired a deep knowledge of Indian linguistics for three principal reasons

1 Because many of them have volunteered to spend their lives among the Indians, either after their five years in college (on entry into the Novitiate), after their two years of Philosophy, or at the end of their four years of Theology Because their appointment is for life, and naturally they take a deep interest in those tongues which they are to use for the rest of their lives

2. Because, being not merely visitors among the Indians but living among the Indians, they are continually with them and often live like them, especially when accompanying them on their hunting trips.

3 Because, in order to treat of religious questions, and hence of intellectual and spiritual questions, they need a more profound knowledge of the grammar and dictionary of the language or dialect of their tribe than is needed, for example, by an explorer, a trader, a policeman, or a radioman.

Let us now come to the work accomplished by them for the last hundred years; that is to say, since the time when, at the instance of Monsignor Signay, they set out in the month of August, 1844, for Ha-Ha Bay by the mouth of the Saguenay and Lake St John to evangelize the Montagnais and the tribes of Labrador (P. LeJeune).

The table of manuscripts and publications (summarized on p. 405) is not complete. It mentions only the writings which have been gathered in our Oblate Archives in Ottawa. Many manuscripts are still to be made available, whether by photography or otherwise, and they are scattered along the whole extent of the

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novitiates (220 scholastics and 92 lay brothers), and *scholasticates* (1,347 Oblate seminarians with two years of philosophy and four years of theology) are raising its youth The Motherhouse has been at Rome, 5 via Vittorino da Feltre, since 1904

[3] Le Jeune, P L *Dictionnaire general du Canada* 2: 711 Ottawa, 1931.

[4] *Ibid*

[5] *Ibid*

[6] Mooney, James. Aboriginal population of America. *Smithsonian Misc. Coll* 80 (7): 33, 1928.

Canadian north. No amount of money could remove them from the missions, because the missionaries have need of them either for themselves or for their missionary pupils. Moreover, they are mission property almost everywhere, therefore, to secure access to them, one must go to the missions to consult them or to make photographs of them.

The manuscripts are generally in letters of our alphabet, and publications printed or mimeographed are either in the same characters or in syllabic characters.

The Syllabarium invented by the Protestant missionary, James Evans, in 1841, is based on the principles of a system of phonetics. There are no silent letters and each syllable is represented by a single character. These characters when combined make up words. This invention has been standardized and popularized by the Ottawa Government, and seems to become more and more popular, particularly among the Eskimos of Hudson Bay. The General Administration of the Oblates has rendered its use obligatory on its own missionaries. It has the advantages of simplifying the orthography of Indian or Eskimo words and of being more effective in teaching to both races.

Another similar system was used by Father LeJeune, Jean-Marie-Raphael, O. M. I. (1850–1930), who was acquainted with the stenographic system of Abbé Duployé from the time of its popularization after the Franco-Prussian War (1870–71), and who made himself a master of it. Finding himself placed by his ministry in successive contact with natives of different idioms, and sometimes with several languages simultaneously, he conceived the project of applying the system by means of the Chinook, or common idiom of commercial relations, to tribal phonetics. Thus he invented a new and permanent means of communication and of catechetical and doctrinal evangelization. In the space of fifty years, success has crowned his efforts and won the applause of ministers of other denominations.

The series of his pamphlet works on Indian languages is here condensed:

Practical Dictionary of Chinook, 1886
Elements of Stenography, 1891.
Stenographic ABC of the Thompson Language with Hymns and Chants, 1891
Catechism Prayers in Chinook and Thompson
Joseph Sold by His Brothers (a drama in Chinook), 1892.
Kamloop Wawa, a monthly review in mimeograph, photography, and typewriting, 1892–1904 (Publication honored by a gold medal at the stenographic competition of Montlhéry (Seine-et-Oise) in 1896.)
Chinook Dictionary, 1892, and Bible History.
Catechism in Shushwap, 1893
Prayers in the Okanagan Language, 1893
A Manual of Prayers and Catechism in English, 1896
A Manual of Hymns and Chants in Latin for the Use of All the Indians, 1896
A Book of Prayers in Eleven Languages, 500 pages, 1896
Adaptation of Duployé's Stenographic System to English, 1896
A Book of Devotion in Chinook, 1903
Trial of the Martyrs in Chinook, 1904
The Mission of Kamploop, 1886, 1895, 1909

The system of Father LeJeune seems to have prevailed in the far West, while that of Evans has prevailed in central and eastern Canada. Which of the two is more advantageous, I am not competent to judge.

The system of C. R. Lepsius, a standard alphabet for reducing unwritten languages and foreign graphic systems to a uniform orthography in European letters, seems to have been rejected by our missionary linguists. They preferred to utilize the Latin sounds familiar to all as well as their mother tongue, which is for the most part French.

This is the summary of the contents of this table.

1	Algonkin	14 MSS	7 publications
2	Blackfoot	2 "	9 "
3—	Cree (Muskegon)	4 "	9 "
4-	Cree (Plains)	3 "	51 "
5—	Montagnais	16 "	28 "
6	Ojibwa	1 "	7 "
7 -	Beaver	0 "	2 "
8 -	Carrier	0 "	3 "
9 -	Chipewyan	0 "	4 "
10-	Hare	0 "	7 "
11 -	Kutchin (Loucheux)	0 "	2 "
12-	Slave	5 "	4 "
13—	Eskimo	4 "	2 "
14—	Haida	0 "	1 "
15-	Huron	1 "	0 "
16—	Iroquois	0 "	1 "
17—	Shuswap (Salish)	0 "	3 "
18 -	Thompson	0 "	1 "
19—	Assiniboine	1 "	0 "
20 -	Thlinkit	2 "	0 "
21-	Chinook	0 "	4 "
	Total	52 MSS	145 publications

Besides, there are periodicals or journals printed in Indian language at several of the missions, principally by the Hobema, Alberta, mission, in the Cree language, and by Mgr Turquetil in the Eskimo language Likewise, there are calendars in Indian and Eskimo, reproduced and distributed in most of the Oblate missions Some volumes have been published by the Oblates on the ethnology of the Indian and the Eskimo, but these would hardly be classed as linguistic works

Of the 40 tribes or so evangelized by the Oblates, only 21 are represented in this report and in the above table, and even these 21 are not yet represented completely, that is as much as to say that much still remains to be done to gather together all the documents which are actually distributed over a wide territory I hope that this enterprise may be brought to completion, and that we will soon be able to place at the service of the linguistic scholars of the country this "Inexhaustible Source of Indian Linguistic Knowledge."

The cordial assistance of the Catholic University of America, of Dr John K. Cartwright, of the Catholic Bishops of the Indian and Eskimo Missions, Mgrs G Breynat, Turquetil, Bunoz, Coudert, and Belleau, and most especially the generous help of the American Philosophical Society of Philadelphia, have made it possible for me to accomplish part of this task, aside from my extensive work on the habitat or environment of the Eskimo

Linnaeus, one of the greatest of naturalists, said of himself, *Laudatur et alget*, that is, "Honored yes, yet *I suffer*"—meaning that poverty haunted him in spite of his fame, and that he was too proud to beg assistance To me, a priest, no such pride stands in the way of asking assistance and of practicing the virtue of gratitude in this regard

More than that, I consider myself honored to have the co-operation of such distinguished patrons.

As the Eskimo would put it, *pesoyuk*—meaning amen, or thank you.

THE EARLIEST ACCOUNT OF THE ASSOCIATION OF HUMAN ARTIFACTS WITH FOSSIL MAMMALS IN NORTH AMERICA

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ABSTRACT

The discoveries of human artifacts associated with the remains of fossil animals, claimed to have been made by Albert Koch in 1839, have long been discredited. In this paper the evidence is resurveyed in the light of modern discoveries and knowledge, and it is concluded that it is highly probable that Koch actually made the discoveries which he claimed to have made. It is shown that it is not only highly probable that he discovered human artifacts in association with mastodon remains, but that it is also probable that he discovered such artifacts in association with the remains of the fossil ground sloth, *Mylodon harlani*. Finally, evidence is adduced which suggests that Koch was also the first discoverer of Folsom type points.

ON Saturday, January 12, 1839, there appeared in *The Presbyterian*, a weekly newspaper published at Philadelphia, a most interesting article which gave the first account of the association of human artifacts with a fossil mammal in North America. Here is the original article:

THE MAMMOTH

It is with the greatest pleasure, the writer of this article can state, from personal knowledge, that one of the largest of these animals, has actually been stoned and buried by Indians, as appears from the implements found among the ashes, cinders and half burned wood and bones of the animal. The circumstances are as follows.

A farmer in Gasconade county wished to improve his spring, and in doing so, discovered, about five feet beneath the surface, a part of the back and hip bone. Of this I was informed by Mr. Wash, and not doubting but the whole, or nearly the whole skeleton might be found, I went there and found as had been stated, also a knife made of stone. I immediately commenced opening a much larger space; the first layer of earth was a vegetable mould, then a blue clay, then sand and blue clay. I found a large quantity of pieces of rocks, weighing from two to twenty-five pounds each, evidently thrown there with the intention of hitting some object. It is necessary to remark, that not the least sign of rocks or gravel is to be found nearer than from four to five hundred yards; and that these pieces were broken from larger rocks, and consequently carried here from some express purpose. After passing through these rocks I came to a layer of vegetable mould, on the surface of this was found the first blue bone, with this a spear and axe, the spear corresponds precisely with our common Indian spear, the axe is different from any one I have seen. Also on this earth was ashes nearly from six inches to one foot in depth, intermixed with burned wood, and burned bones, broken spears, axes, knives, etc. The fire appeared to have been the largest on the head and neck of the animal, as the ashes and coals were much deeper here than in the rest of the body, the skull was quite perfect, but so much burned, that it crumbled to dust on the least touch, two feet from this, was found two teeth broken off from the jaw but mashed entirely to pieces. By putting them together, they showed the animal to have been much larger than any heretofore discovered. It appeared by the situation of the skeleton, that the animal had been sunk with its hind feet in the mud and water, and unable to extricate itself, had fallen on its right side, and in that situation was found and killed as above described, consequently the hind and fore foot on the right side, were sunk deeper in the mud, and thereby saved from the effects of the fire, therefore I was able to preserve the whole of the hind foot to the very last joint, and the fore foot all but some few small bones that were too much decayed to be worth saving. Also between the rocks that had sunk through the ashes, was found large pieces of skin, that appeared like fresh tanned sole leather, strongly impregnated with the ley from the ashes, and a great many of the sinews and arteries were plain to be seen on the earth and rocks, but in such a state as not to be moved, excepting in small pieces, the size of a hand, which are now preserved in spirits.

Should any doubts arise in the mind of the reader, of the correctness of the above statement, he can be referred to more than twenty witnesses, who were present at the time of digging.[1]

Like all the articles in *The Presbyterian* this one was unsigned. *The Presbyterian* was a full-

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[1] *The Presbyterian* 9 (2): 8, 1839.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 5, MAY, 1944

sized newspaper of two leaves and four pages. The fourth page was generally devoted to the printing of miscellaneous items of scientific and general educational interest. These were, on the whole, remarkably well written, and there can be little doubt that it was a page to which readers with scientific interests looked forward with pleasurable anticipation Be this as it may, in July 1839, Benjamin Silliman of New Haven reprinted this unsigned article in *The American Journal of Science and Arts*, prefacing it with the remark that "The following statement is so interesting and important that we give it a place, although it is deficient in responsibility We request the unknown author to communicate with us directly "[2]

The unknown author does not appear to have complied with this request, he seems to have been far too busy assorting the recovered bones of the animal referred to, and reconstructing it from them Furthermore, Mr. Albert Koch, our unknown author, was doing a not inconsiderable trade in the fossil bones which he was excavating In 1840 he sold a collection of bones of mastodon and other extinct animals to a group of members of the American Philosophical Society, who in turn presented them to the Society W E Horner examined these bones and delivered a report on them at a meeting of the Society held October 2, 1840[3]

Actually what Koch had discovered in Gasconade County was, almost certainly, the remains of neither a mastodon nor a mammoth, but those of a ground sloth It was early in the year 1840 that Koch unearthed the virtually complete skeleton of his mastodon This he promptly named the "Missourium," after the fact that it had been found in the State of Missouri (in Benton County)

At the beginning of the year 1841 Koch published, at St Louis, Missouri, a pamphlet of sixteen pages describing the discovery of a fossil mastodon, the "Missourium "[4]

Koch's account of his find and his description of the skeleton were very well written, and show him to have been a collector of some ability and keen intelligence He recognized that the "Missourium" was a mastodon It was, in fact, an excellent specimen of *Mastodon americanus*, first described by Kerr in 1792 as *Elephas americanus*,[5] and subsequently figured by Richard Owen as the best preserved example of its kind[6]

In the first edition of his pamphlet nothing is said of any human artifacts associated with the Gasconade County fossil remains. After exhibiting his "Missourium" at St Louis, Koch decided to take his prize specimen, together with a good part of his collection of fossils, to Europe Before embarking, he appears to have exhibited the "Missourium" at Louisville, Kentucky Here, in the summer of 1841, was issued an enlarged second edition of his pamphlet containing an account of "Evidence of Human Existence Contemporary with Fossil Animals."[7]

It is from this pamphlet that we discover that Albert Koch and the author of the unsigned article in *The Presbyterian* are one and the same person Because of the importance of this new account of his discovery, it is reproduced here in his own words

EVIDENCE OF HUMAN EXISTENCE CONTEMPORARY WITH FOSSIL ANIMALS

It is well known by all persons acquainted with geology, that it is admitted as a fact, that the mastodons, together with the generality of antideluvian animals, existed and became extinct previous to the creation of the race of men, which supposition was founded on the fact that no evidence of human existence could be traced back to, or found with, those antideluvian animals The positive cause of this I do not know My opinion, however, is that this want of evidence of a former human race is, that those relicts of the ancient animal world generally, have been found accidentally by persons who were not aware of the importance of a minute and critical examination of the deposits disinterred by them, and therefore the scientific observer was deprived, no doubt, often of the facts necessary to be known in order to form correct opinions on this subject In view of this I deem it my duty to lay before the world what facts I have been able to gather on this interesting subject, which will be strong evidence in favor of my belief, that there was a human race existing contemporary with those animals.

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[2] The mammoth (mastodon? eds) *Am Jour Sci and Arts* 36 198–200, 1839.

[3] Note of the remains of the mastodon, and some other extinct animals, collected together in St. Louis, Missouri. *Proc Am. Philos Soc* 1 (13) 279–282, 1840

[4] *Description of the Missourium, or Missouri Leviathan, Together with its supposed habits, Indian Traditions concerning the Location from whence it was exhumed; Also, Comparisons of the Whale, Crocodile And Missourium, with the Leviathan, As described in the 41st chapter of the Book of Job.* St. Louis, Printed by Chas. Keemle, No. 22 Olive Street. 1841 (On the yellow cover of the pamphlet the date is printed "1840.")

[5] H. F. Osborn. *Proboscidea* 1 164 New York, 1936

[6] R. Owen, *A History of British Fossil Mammals and Birds*, 298, fig 102 London, 1846.

[7] A pamphlet of 20 pages, in gray-brown wrappers, with a good engraving of the "Missourium" on the front wrapper, and the note, "Second Edition Enlarged " The pamphlet represents an entirely new printing. The title-page exactly follows the wording of the first edition, without any statement of edition or revision, but with the place and name of the new publisher, "Louisville, Ky., Prentice and Weissinger, Printers, 1841," substituted for the old.

These facts are as follows In October, 1838, I disinterred the remains of an animal which had clawed feet and was of the size of an elephant This deposite was in Gasconade county, Missouri, on the shores of the Burbois river The principal part of this animal had been consumed by a fire, which fire evidently had not been produced by a volcanic eruption, but had been formed and kindled mechanically by human hands, as it appeared, for the purpose of destroying the before mentioned animal, which had been mired here and was unable to extricate itself The particulars of the transaction were as follows

A farmer in Gasconade county, Missouri, perceived for some time a disagreeable taste in the water which he used for his household This water was taken out of a clear spring, situated in what is usually called a bottom, near his house For the purpose of remedying this evil, he dug around and into the spring, thus to be enabled to enclose it afterwards as a well By doing so, he found several bones belonging to an animal of unusually large size Some were whole, some in fragments Also at the same time he found a stone knife and an Indian axe This circumstance created some excitement in the neighborhood, and these transactions were mentioned to me sometime afterwards by a Mr Wash, who lived in the vicinity

On hearing this, I immediately made arrangements to proceed to the place On my arrival there, in October, 1838, I found the prospects rather dull, as the bones which had been dug out of the spring were principally destroyed They had been removed from their place of embedment without the least care, and were of course more or less broken, then exposed to the air without any kind of preservation being applied to them; and eventually what few remained tolerably whole, were broken by their curious visitors to ascertain if they contained marrow, until the few remaining fragments were collected together by an intelligent gentleman by the name of Bailey, residing in the neighborhood, who presented them to me, and assisted me in my further researches. I found nine feet beneath the surface a layer of ashes from six to twelve inches in thickness, mingled with charcoal, large pieces of wood partly burned, together with Indian implements of war, as stone arrowheads, tomahawks, &c &c. Also more than one hundred and fifty pieces of rocks, varying from three to twenty-five pounds in weight, which must have been carried here from the rocky shores of the Burbois river, a distance of 300 yards, as there was no rock, stones, or even gravel near to be found, and those pieces of rocks taken out of the ashes were precisely the same as that found on the river, which is a species of limestone, these had been thrown evidently with the intention of striking the animal I found the fore and hind foot standing in a perpendicular position, and likewise the full length of the leg below the layer of ashes, so deep in mud and water that the fire had no effect upon them

The fore foot of the animal consists of four toes and a thumb, each toe has five joints, each last joint armed with a claw, or long nail The thumb has two joints, the crown of the foot is composed of four bones, joined together, and each connected to a toe On top of this is a thin, round bone, connecting them with the shin bones The construction of this foot shows that it possessed much power in grasping and holding objects The hind foot is smaller, and also has four toes, with five joints, but has no thumb The crown is entirely different in construction from that of the fore foot A few of the teeth appeared to have been broken out by the force of the rocks thrown at the head of the animal, and were carried some little distance, so that they escaped in a measure the violence of the fire, and have all the appearance of those of a carniverous animal

The second trace of human existence with these animals, I found during the excavation of the Missouri Leviathan There was embedded immediately under the femur, or hind leg bone of this animal, an arrowhead of rose colored flint, resembling those used by the American Indians, but of larger size This was the only arrow head immediately with the skeleton, but in the same strata at a distance of five or six feet, in a horizontal direction, four more arrow-heads were found, three of these were of the same formation as the preceding, the fourth was of very rude workmanship One of the last mentioned three was of agate, the others of blue flint These arrow-heads are indisputably the work of human hands I examined the deposite in which they were embedded, and raised them out of their embedment with my own hands[3]

In this, the earliest account of the association of human artifacts with the remains of fossil mammals in North America, we have, oddly enough, one of the clearest and best evidences of the antiquity of man in North America that has ever been published Yet Koch's statements have nearly always been dismissed as unworthy of belief He has been ridiculed and completely shut out of court. None of his critics has ever taken the slightest trouble to check any of his findings, although Koch clearly stated where his materials were to be found, even after he had sold them. No one has ever examined his statements by checking them against the findings and discoveries of later investigators, discoveries which in every detail assist to increase the probability that Koch discovered what he claimed to have discovered.

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[3] *Ibid* 19-20

Koch has been quite properly criticized for exaggerating the height of his mastodon and the length of his "Hydrarchos" (Basilosaurus), and of having the imagination of a Baron Munchausen,[9] but it does not seem to have occurred to anyone that no Munchausen could, without previous example to lean upon, have given so accurate and detailed an account of his findings as did Koch.[10]

Koch, who arrived in America from Germany in or about 1835, appears to have earned a living by collecting fossils and by exhibiting and selling the more spectacular examples of his collections. He was not a trained scientist, and he made numerous errors in reconstructing his fossil animals. He was evidently a good publicity man and something of a traveling salesman. In view of these facts it is not difficult to understand why his good faith has been doubted.

Writing in 1871, five years after the death of Koch, P. R. Hoy states that in March 1840 he visited the spot on the Pomme de Terre where Koch had recently disinterred the skeleton of the "Missourium." Here he learned that the scapula of the "Missourium" was actually discovered at a level of *two feet* beneath the surface. This was sufficiently strong proof of Koch's "want of accuracy" and "lively imagination" to cause the gallant gentleman to delay reporting his findings until five years after the death of Koch and thirty-one years after his original visit![11]

In 1875, James D. Dana examined Koch's claims in an article which completely discredited Koch and many of his statements. He concluded with the words: "Taking all things that have been reviewed into consideration, I think there is sufficient reason for regarding Dr. Koch's evidence of the contemporaneity of Man and the Mastodon as *very doubtful*."[12]

Earlier the same year, J. W. Foster had published the following important statement on Koch and his findings:

> The late Dr. Koch, of St. Louis, who disinterred, in the Osage Valley of Missouri, the skeleton of a mastodon which now forms so conspicuous a feature in the palaeontological department of the British Museum, stated that, in connection therewith, were found flint arrowheads and remains of charcoal, as though the aborigines had attacked and destroyed the animal when mired. This statement, at the time, was received by the scientific world with a sneer of contempt. It was my fortune to be thrown in company with Dr. Koch for several days, during the last year of his life, and among other things I questioned him very pointedly as to the possibility of his having been mistaken, when he assured me in the most solemn and emphatic manner, that his statement was true. He was an indefatigable collector, and few men in this country, by individual effort alone, have been more successful in bringing to light so many of the skeletons of the huge animals that roamed over the land or swarmed the seas of past ages. His knowledge in many branches of Natural History was considerable, but not of that exact character to bring out important generalizations. No one who knew him will question but that he was a competent observer, and to deny the accuracy of his statement is to accuse him of having attempted to perpetrate a scientific fraud. It may be said, however, that the scientific opinion of this country regarded his statements in about the same light as the French geologists did those of M. Boucher de Perthes, when he brought out his *Antiquités Celtiques*—that is with absolute distrust; but the one lived to see the truth of his observations acknowledged and their value appreciated, the other died with a cloud hanging over his reputation.[13]

Dana was familiar with Foster's appraisal of Koch's veracity, and simply chose a part of a sentence to rebut. The issue, he declared, was not whether or not Koch was attempting to perpetrate a scientific fraud, for science must be constantly on guard against the wrong conclusions of men who are not competent to judge, yet who hold honest beliefs. The essential point, he argued, was that Koch was a traveling salesman who sold entertainment to gullible people, exaggerating the magnificence of the skeletons that were his stock in trade, and that therefore his judgment as to what he had found was not to be trusted

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[9] G. P. Merrill. *The First One Hundred Years of American Geology*: 213–215. New Haven, 1924.

[10] Professor William Berryman Scott, the doyen of American paleontologists, with whom the senior author recently had the pleasure of discussing Koch's claim to have discovered human artifacts, stated that he did not see how Koch could possibly have invented the story. Professor Scott has himself criticised Koch's fantastic reconstruction of his fossils, but believes it highly probable that the discovery of artifacts in association with the remains of mastodon was actually made. For Professor Scott's earlier criticism, see his article, "American Elephant Myths" (*Scribners Magazine* 1: 469–478, 1887).

[11] P. R. Hoy. Dr. Koch's Missourium. *Am. Naturalist* 5: 147–148, 1871.

[12] J. D. Dana. On Dr. Koch's evidence with regard to the contemporaneity of man and mastodon in Missouri. *Am. Jour. Sci. and Arts*, ser. 3, 9: 335–346, 1875.

[13] J. W. Foster. *Pre-Historic Races of the United States of America*: 62. Chicago and London, 1873.

This is, of course, a fair and sound judgment, for it is the tragedy of such men as Koch that even when they speak the truth they shall not be believed Bearing this in mind, our task in the present paper must be to determine the degree which attaches to the probability that Koch was speaking the truth.

From Koch's account it is clear that we are dealing with two separate finds of fossil animals with which human artifacts were associated In the first case the remains recovered in October 1838 were, as far as we are able to judge from Koch's description, almost certainly those of the ground sloth, *Mylodon harlani*[14] (Gravigrada) With the remains were found charcoal, ashes, partly burned wood, stone arrowheads, tomahawks, "&c. &c ," and more than 150 rocks at a distance of more than 300 yards from the Burbois River, the nearest site of the occurrence of anything resembling such rocks

The evidence seems to be indisputable The creature was caught in the mud, and there killed and partially consumed by the "Indians," but the stratigraphical evidence is insufficient to permit of any age estimate of the deposit in which the sloth and the associated artifacts were found.

For the mastodon, discovered early in 1840, Koch's geological evidence is more satisfactory Here it is in his own words·

THE LOCATION AND EXCAVATION OF THE BONES

The bones were found by me near the shore of the river *La Pomme de Terre*, a tributary of the Osage river, in Benton County, in the state of Missouri, latitude 40 and longitude 18. There is every reason to believe that the Pomme de Terre, at some former period, was a large and magnificent stream, from one-half to three-fourths of a mile in breadth, and that its waters washed the high and rocky bluffs on either side, where the marks of the rolling surges are now perfectly plain· they present a similar appearance to that of the Missouri and Mississippi. It appears from the different strata, that since the Missourium existed, six or seven different changes have taken place here, by which the original bed of the Pomme de Terre was filled with as many different strata, which are as follows

The original stratum on which this former river flowed at the time it was inhabited by the Missourium, and up to the time of its destruction, consisted of quicksand, on the surface of its stratum, and partly mingled with it, was the deposit of the before mentioned skeleton The next stratum from three to four feet in thickness, consisting of a brown alluvial soil, in this all the remainder of the skeleton was contained, and covered by it This stratum was mixed with a great quantity of vegetable matter, and most of this in a wonderful state of preservation, but what is still more surprising, all of the vegetable remains are tropical or very low southern production They consisted of large quantities of cypress burs, wood and bark, a great deal of tropical cane and tropical swamp moss, several stumps of trees, if not logwood, yet bearing a close resemblence to it, even the greater part of a flower of the Strelitzia class, which, when destroyed, was not full blown, was discovered embedded in this layer, also several stems of palmetto leaf, one possessing all the fibers perfect, or nearly so To those who are not acquainted with the nature of this plant, it is well to remark, that it is not found at present farther north than the northern parts of Louisiana

The time when the revolution of the earth took place, during which this before described animal lost its life, was between the 15th of September and 20th of October, which is proven by the fact just mentioned of the cypress burrs being found; from which circumstance might be readily inferred, that they had been torn by force from their parent stem before they had arrived at perfection and were involved in one common ruin with the trees which bore them, these having been torn up by the roots, and twisted and split into a thousand pieces, apparently by lightning, combined with a tremendous tempest or tornado There is no sign or indication of any very large trees, the cypresses that were discovered being the largest that were growing here at the time

Through this stratum ran several veins of iron ore—sufficient evidence of the antiquity of this deposite Immediately over this was one of blue clay, three feet in thickness, the next was one of gravel 9 to 18 inches in thickness, so hard compressed together that it resembled pudding stone, the next was a layer of giant blue clay, from 3 to 4 feet in thickness, on this was another stratum of gravel, of the same thickness and appearance of the first one mentioned; this was succeeded by a layer of yellowish clay, from 2 to 3 feet in thickness; over this, a third layer of gravel, of the same appearance and thickness, and, at last, the present surface, consisting of a brownish clay, mingled with a few pebbles, and covered with large oak, maple and elm trees, which were as near as I could ascertain, from

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[14] Probably the same animal described from Koch's collections in 1843 by R Harlan, "Description of the Bones of a New Fossil Animal of the Order Edentata" (*Am Jour Sci. and Arts* 44 (1): 69–80, 1842).

> 80 to 100 years old In the centre of the above mentioned deposite was a large spring which appeared to rise from the very bowels of the earth, as it was never affected by the severest rain, nor did it become lower by the longest drought
>
> About 200 yards from the said deposite stands a singularly formed rock, which not only bears the appearance, but can be considered as a monument of great antiquity, formed by nature, against whose rough and rugged sides can be distinctly traced, in deep and furrowed lines, the former course of angry waters, yet its summit is full 30 feet above the present level of the Pomme de Terre The rock has the appearance of a pillar, on whose top rests a table rock far projecting over on every side, from the base of the pillar to the lower edge of the table is 30 feet, and from the base down to the deposite of the bones is 16 feet—making, from the stratum on which the bones were deposited to the edge of the table 46 feet
>
> By a minute and close examination, I found that the formation of said rock, as it now appears, was produced by long action of the river against and around it, and had the river continued to act with the same force for one or two hundred years longer, the pillar would have been so far worn away, that the table must have fallen It now stands as an indisputable witness, that the water, at the time these animals existed, was at least 46 feet deep [15]

From this account it would seem that the artifacts found in association with the bones of the mastodon were recovered from a deposit which was laid down in the late Pleistocene

It will be noted that this account has been reprinted from the third edition of Koch's pamphlet, published at London in 1841 Koch appears to have arrived in London in November or December of that year, but before that he had left Louisville to exhibit his collection of fossils at Philadelphia, where those who saw it included a number of scientific men At a meeting of the American Philosophical Society, October 1, 1841, "Dr. Hays invited the attention of the Society to a very extensive and highly interesting collection of fossil bones, chiefly of the Mastodon, recently brought to this city by Mr Albert Koch, of St. Louis."[16] At the meeting of the Society held October 15, 1841, Dr. R Harlan drew attention to the fact that "There is now exhibiting at the Masonic Hall in Philadelphia, one of the most extensive and remarkable collections of fossil bones of extinct species of mammals which have hitherto been brought to light in this country, a gratification for which our Scientific community will acknowledge themselves indebted to the perseverence of the enterprising proprietor, Mr. Albert Koch of St Louis, Missouri" Very gently Harlan pointed out some of the grotesque errors committed by Koch in the articulation of the bones, adding that "no doubt" Koch's "ulterior researches would enable him to rectify these"[17]

From Koch's collection Harlan described part of the fossil remains of an animal which was undoubtedly a ground sloth, *Mylodon harlani*,[18] and probably identical with that referred to by Koch in his pamphlet of 1841

Hays classified Koch's mastodon as belonging to the genus *Tetracaulodon* This, as was later shown, was a nomenclatural error *Tetracaulodon* was a name applied to mastodons with small tusks in the lower jaw, a valid morphological distinction It was, however, later proved to be but the normal juvenile condition, or a normal variation, in *Mastodon*, thus making *Tetracaulodon* a synonym of *Mastodon*

II

Shortly after his arrival in London, Koch made arrangements to exhibit his collection of fossils at Egyptian Hall in Piccadilly The exhibit was probably opened to the public shortly before Christmas, and proved an immediate success, being continued well into the year 1843, when the mastodon and some of the other fossils in the collection were purchased by the authorities of the British Museum. But this is to anticipate

For sale at the Hall Koch printed an enlarged version of his pamphlet, adding to it a catalogue of the fossil bones exhibited together with the mastodon [19]

Koch's specimen of the mastodon was the

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[15] Albert Koch. *Description of the Missourium, or Missouri Leviathan, and a Catalogue of the Whole Fossil Collection.* Third edition enlarged, pp 11–13 London, 1841.

[16] *Proc. Am. Philos. Soc.* 2 (19) · 102, 1841.

[17] R Harlan Description of the bones of a new fossil animal of the order Edentata. *Am. Jour. Sci. and Arts* 44 (1), 69–80, 1842

[18] Oliver P. Hay *The Pleistocene of the Middle Region of North America and its Vertebrated Animals.* 4. Carnegie Institution Washington Publ. 322A, 1924. In Koch's collection there were also remains of another ground sloth, *Megatherium*. See Harlan, *op cit.*

[19] The title-page of this edition follows the wording of the second edition, with the addition, after the words "Missouri Leviathan," of the words "And a Catalogue of the Whole Fossil Collection. Third Edition Enlarged London. E. Fisher, Printer, 33, Cannon Street, City, 1841." There are 24 pages, including the covers, the catalogue occupying pp. 3–6.

finest example of its kind ever to have been exhibited in England, and scientists were very naturally much interested in viewing it Richard Owen, the distinguished palaeontologist and anatomist, was among the first to make a study of the skeleton, and on February 23, 1842, read a memoir on it before the Geological Society of London [20]

Owen commenced his paper with some remarks on the manner in which the Missourium was set up, and after pointing out certain mistakes, "as well as the readiness with which Mr Koch, the proprietor, corrected an error respecting the first pair of ribs," he gave it as his opinion that the Missourium was a male of the species *Mastodon giganteum*

While making several comments on the remainder of Koch's fossil collection, Owen was completely silent on the former's account of the associated human artifacts.

Koch did not agree with Owen's conclusions, and on April 6, 1842, read a paper before the Geological Society defending the position that the Missourium belonged to a distinct genus, namely, *Tetracaulodon* [21] This is the conclusion, it will be recalled, at which Hays of Philadelphia had arrived

On an independent examination of the evidence Dr James Grant, in June of the same year, came to the support of Koch and Hays, stating that the Missourium should be recognized as belonging to the species *Tetracaulodon kochii* [22]

In the same issue of the *Proceedings* of the Geological Society, Alexander Nasmyth presented a report on the microscopic structure of the tusks of the Missourium [23]

In 1843 Owen's article of the preceding year was reprinted in the *Annals and Magazine of Natural History.*[24]

Sometime during 1843 Koch took his collections to Ireland where they, together with the Missourium, were exhibited at Dublin Here appeared the "Fifth edition, enlarged," of his pamphlet together with a new title-page and a completely rewritten and revised text [25] In the "Preface," added to this edition, Koch writes (p 2) "Previous to my commencing this Treatise, I wish particularly to mention, that I have not only devoted the greater part of my life to the theoretical study of Natural History, but have also made myself intimately acquainted with the practical part of it "

There is good reason to believe that this boast was somewhat of an overstatement

Late, probably, in 1843 Koch packed up once more and took a good part of his collections to Europe, this time heading straight for Berlin Here his collection aroused considerable interest, and, doubtless in order to satisfy some of this interest, he prepared a book, which, however, was not published until 1845 [26]

In this volume Koch discusses the subject of prehistoric life in general and the Missourium in particular, while no less than 46 pages are devoted to the description and discussion of his discovery of human artifacts together with the remains of the mastodon (pp 53-99)

Meanwhile, in May 1844, Koch packed up his fossil collection, having previously disposed of the mastodon and some other fossils to the British Museum, and returned to America It is said that he received for the skeleton a sum of $2,000 outright, and an annuity of $1,000 a year He drew the annuity for twenty-six years, until his death at St Louis in 1866 [27] Immediately after his return to America he set out again upon his fossil-collecting travels. In Alabama, in March 1845, he discovered what he called a "gigantic fossil reptile," the "Hydrargos" or "Hydrarchus." This, as we learn from the pamphlets published by him, was exhibited in New York during the summer of 1845[18] The exhibition was held in the Apollo Rooms on Broadway and attracted a considerable amount of attention from both the public and the press Here, too, among other things, Koch exhibited the arrowhead which he had discovered with his first fossil, and this, in particular, drew expressions of the greatest interest from the press The edition of Koch's pamphlet describing the "Hydrarchus" was soon exhausted, and a second edition with a significantly new title-page was issued at once[19]

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[20] R Owen Report on the Missourium now exhibiting at the Egyptian Hall, with an inquiry into the claims of the Tetracaulodon to generic distinction *Proc Geol Soc London* 3, pt. 2 (87). 689–695, 1842

[21] A. Koch. On the genus Tetracaulodon *Proc Geol Soc. London* 3, pt 2 (87). 714–716, 1842

[22] J Grant. On the structure and history of the mastodontoid animals of North America *Proc Geol Soc London* 3, pt. 2 (90)· 770–771, 1842

[23] A. Nasmyth. On the minute structure of the tusks of extinct mastodontoid animals. *Proc Geol Soc London* 3, pt. 2 (90): 775–780, 1842 See p 779.

[24] R. Owen. Report on the Missourium now exhibiting at the Egyptian Hall with an inquiry into the claims of the Tetracaulodon to generic distinction *Ann. and Mag. Nat. Hist.* 11. 147–153, 1843.

[25] *Description of the Missourium Theristocaulodon* (Koch), *or Missouri Leviathan*, (Leviathan Missouriensis,) *together with its supposed habits, and Indian Traditions, also, comparison on the Whale, Crocodile, and Missourium, with the Leviathan, as described in the 41st Chapter of the Book of Job*, by Albert Koch Printed by C Crookes, 87 Chapel Street, Dublin 28 pp, 8°, 1843 Wedgewood blue wrappers, on the front of which there is a wood (?) engraving of the Missourium, beneath whose ribs there stands an Indian with spear in hand To the right, for comparison, there is figured an Indian elephant complete with mahout

[26] Albert C Koch *Die Riesenthiere der Urwelt oder das neuentdeckte Missourium Theristocaulodon* (*Sichelzahn aus Missouri*) *und die Mastodontoiden im Allgemeinen und Besondern, nebst Beweisen, dass viele, uns durch ihre Ueberreste bekannt gewordene Thiere nicht prädamitisch, sondern Zeitgenossen des Menschengeschlechts waren* Berlin, Verlag von Alexander Duncker vii+99, 8 pl, 1845

[27] Information kindly supplied by Dr Harold A Bulger of the School of Medicine of Washington University and Librarian to the Academy of Natural Sciences of St Louis But see Dana, this paper, p. 415.

The substitution of Harlan's name for that of Silliman for the "species" of his "Hydrarchus" was a "tacit" admission of the fact that this "sea-serpent" was in reality a fossil cetacean earlier named by Harlan, from the remains of a very incomplete specimen, *Basilosaurus cetoides*. Owen had described a specimen as early as 1832 under the name *Zeuglodon*, while the specimen described by Harlan was discovered by S. B Buckley in 1842. Three long and interesting discussions of the exhibition at the Apollo Rooms or Saloon are reprinted at the end of this pamphlet, respectively from the *New-York Dissenter*, the *New-York Evangelist*, and the *New-York Morning News*.

On the title-pages of these pamphlets it will be observed that Koch is for the first time referred to as "Doctor" Whether Koch arrogated this title unto himself or whether it was conferred upon him, we do not know.

Before leaving Germany to return to the United States, Koch sold a good part of his collection of fossils to the Royal Museum of the University of Berlin With these fossils Koch also sold some of the artifacts and other materials he had recovered together with the bones of the mastodon

Sometime during the exhibition of the skeleton of "Hydrarchos" on Broadway in New York, Jeffries Wyman examined the grotesque reconstruction and published his report on it in November of the same year[20]

Wyman showed that the "Hydrarchos" was not a reptile but a mammal, and that the remains belonged to more than one animal. Parts of the paddle were not bones but the casts of the cavities of a camerated shell, a species of *Nautilus* It was a repetition of such errors which served to bring Koch into disrepute among scientists. This specimen was subsequently destroyed in the great fire of Chicago

While Wyman was reading his paper on the "Hydrarchos" to the Boston Society of Natural History, Koch was exhibiting the subject of that paper in Boston itself. Here it was that Charles Lyell saw it in October 1845. He writes.

> During the first part of my stay in Boston, October, 1845, we one day saw the walls in the principal streets covered with placards, in which the words SEA SERPENT ALIVE figured conspicuously On approaching near enough to read the smaller type of this advertisement, I found that Mr. Koch was about to exhibit to the Bostonians the fossil skeleton of "that colossal and terrible reptile the *sea serpent*, which, *when alive*, measured thirty feet in circumference" The public was also informed that this hydrarchos, or water king, was the leviathan of the Book of Job, chapter xli.[21]

Lyell adds that "in the opinion of the best comparative anatomists" Koch's hydrarchos was no snake but a cetacean. Later in his book Lyell records, under date of February 4, 1846, a visit to the exact spot, 4½ miles southwest from Clarkesville, Alabama, where Koch disinterred a portion of the skeleton of the hydrarchos, and mentions that portions of the vertebral column "were procured in Washington county, fifteen miles distant in a direct line from this place, where the head was discovered."[52]

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[18] *Hydrarges, or Great Sea Serpent of Alabama, 114 feet in length, 7,500 lbs. weight, Now exhibiting at the Apollo Saloon, 410 Broadway Admittance 25 cents.—Description of the Hydrargos Sillimanii* (Koch) *A Gigantic fossil Reptile, or Sea Serpent. lately discovered by the author in the State of Alabama, March 1845 Together with some geological observations made on different formations of the rocks during a geological tour through the Eastern, Western and Southern parts of the United States, in the years 1844–45;* by Doctor Albert C Koch, Corresponding Member of the Societies of Halle, and Dresden, &c, New York. 16 pp., 8°, 1845

[19] *Description of the Hydrarchos Harlani*, (Koch.): (*The name Sillimanii, is changed to Harlani, by the particular desire of Professor Silliman.) A Gigantic Fossil Reptile: Lately discovered by the Author, in the State of Alabama, March, 1845 Together with some geological observations made on different formations of the rocks, during a geological tour through the Eastern, Western, and Southern parts of the United States, in the years 1844–1845*. By Doctor Albert C. Koch Corresponding Member of the Societies of Halle, and of Dresden, &c. Second Edition, New-York: 24 pp., 8°, 1845.

[20] J. Wyman. Hydrarchos Sillimani. *Proc. Boston Soc. Nat Hist.* 2: 65–68, 1845

[21] Charles Lyell. *A Second Visit to the United States of North America*, vol. 1. London: 131–132; 1849; New York: 107–108, 1849.

In a letter to Benjamin Silliman, Jr., dated February 4, 1846, Lyell repeats these details.[53]

In 1846, James D. Dana, in his editorial capacity, wrote a devastating account of Koch's "Hydrarchos" in *The American Journal of Science*, to which he added some remarks on the "Missouri Leviathan," stating, among other things, that "the trustees of the British Museum paid the owner £1000 sterling (not '£2000') for this skeleton, and £300 additional for some accompanying bones This we know from the very best authority "[54]

Early in 1846 Koch, together with his "Hydrarchos" and other specimens, sailed for Germany. Here he exhibited in Berlin and later in Dresden. In the latter city the "Hydrarchos" attracted the attention of the great anatomist C G Carus, who, having made a study of it, published a monograph on the specimen in 1847 [55]

Among the prize exhibits in Koch's collection at Berlin was the "Hydrarchus," an enormous fossil cetacean (actually *Basilosaurus cetoides*). It is, almost certainly, this skeleton which, it is said, Koch sold for a yearly pension of 1,000 Reichstalern to King Frederick Wilhelm IV for the anatomical collection of the Royal Museum in Berlin. This skeleton consisted of the remains of at least five individual cetaceans of at least two genera (but mostly *Basilosaurus*) besides some wholly extraneous bits The surviving parts are in the University of Berlin.

In 1847 Koch published a volume describing his travels in the United States during the years 1844 to 1846.[56]

By the end of July 1847 Koch was once again back in the United States in search of the remains of another "Hydrarchos." By February 1848 he had succeeded in recovering the fossil remains of several specimens in Washington County, Alabama. Early in 1849, Koch, who had by now practically become a trans-Atlantic commuter, was in Dresden exhibiting his finds to the public, and telling that same public something about the American Indian and his relations with the whites.[57]

III

We do not encounter Koch again until the year 1853 when he appears to have been on tour with his friend "Hydrarchos" At New Orleans in that year he published a pamphlet describing the creature [58]

Evidently Koch was still traveling around the country exhibiting his startling specimens of prehistoric life But shortly after this, Koch returned to St Louis where he seems to have settled down to a more tranquil existence Here Koch joined the newly founded Academy of Science of St Louis where, on January 26, 1857, he was appointed Chairman of the standing committee on Comparative Anatomy. On the same day Koch, possibly feeling that insufficient attention had been paid to his discovery of the association of human artifacts with the remains of fossil mammals, read an important paper on the subject [59]

In describing the artifacts found with the remains of the ground sloth, Koch adds some interesting new evidence He writes.

> The two arrow-heads found with the bones were in such a position as to furnish evidence still more conclusive, perhaps, than in the other case, of their being of equal if not older date, than the bones

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[52] *Ibid.* 2: 74-75.

[53] *Am. Jour Sci.*, ser 2, 1. 313, 1846.

[54] [James D. Dana.] "Zeuglodon Cetoides" and "Mastodon Giganteus." *Am. Jour Sci.*, ser 2, 2 129-133, 1846.

[55] C. G. Carus. *Resultate geologischer, anatomischer und zoologischer Untersuchungen über das unter dem Namen Hydrarchos von Dr. A C Koch zuerst nach Europa gebrachte und in Dresden ausgestellte grosse fossile Skelett.* Dresden und Leipzig, Arnoldische Buchhandlung: vii+16, 7 pl, folio, 1847

[56] A. C. Koch. *Reise durch einen Theil der Vereinigten Staaten von Nordamerika in den Jahren 1844 bis 1846.* Dresden und Leipzig, Arnoldische Buchhandlung: 162 pp., 8°, 1847.

[57] *Kurze Bemerkungen uber die aus mehreren Arten bestehende Familie der Hydrarchen, der grössten und gewaltigsten Raubthiere der Urwelt Nebst einigen Worten über die Auffindung des grossen, zu jener Familie gehörenden Zeuglodon, welches 1848 vom Verfasser in Alabama gefunden und von da zuerst nach Dresden gebracht wurde Mit einer Zweiten Abtheilung, enthaltend einige in moglichster Kurze erzählte Kampfscenen der Indianer mit den Weissen Ansiedlern Amerika's* Von Dr Albert C. Koch Dresden, Druck der Königl Hofbuchdruckerei, von C C Meinhold und Söhne 32 pp., 8° [1849].

[58] *Description of the Family of Animals now Extinct, but Known to the Scientific World under the Appellation of Hydrarchos.* By Dr. Albert Koch New Orleans Printed at the Office of the Daily True Delta, 1853 A pamphlet of 16 pages, including the most interestingly spectacular pink wrappers, on which, among other things, is printed that part of the 41st chapter of Job which refers to the Leviathan.

[59] A C. Koch. Mastodon remains, in the State of Missouri, together with evidences of the existence of man contemporaneously with the mastodon. *Trans Acad Sci. St. Louis* 1 61-64, 1857.

> themselves; for, besides that they were found in a layer of vegetable mould which was covered by twenty feet in thickness of alternate layers of sand, clay and gravel, one of the arrow-heads lay underneath the thigh-bone of the skeleton, the bone actually resting in contact upon it, so that it could not have been brought thither after the deposit of the bone, a fact which I was careful thoroughly to investigate
>
> This layer of vegetable mould was some five or six feet thick, and the arrow-heads and bones were found, not upon its surface but deeply buried in it, together with fragments of wood and roots and logs and cones of cypress; but no pebbles were observed in it Above this layer of mould there were six undisturbed layers of clay, sand, and gravel, viz, three of greyish clay, and three of pebbly gravel mixed with coarse sand, in all, twenty feet in thickness, and a forest of old trees was standing on the surface soil. This bottom is still subject to occasional overflow, in very high stages of water
>
> If we consider the manner in which these river bottoms have been formed, as it has been admirably illustrated by Prof Swallow (Rep of Geol Sur Missouri),[40] the layers of vegetable mould appearing to have been formed at the bottom of lakes, or in swampy depressions, left filled with water on the retiring of great overflows, or on a change of the bed of the river, at distant periods of time, and that, in these lakes and depressions, a deposit, at first, of clayey sediment, and then, of decaying vegetable matters, gradually accumulates to a considerable depth, before another overflow covers the whole, again, with layer of sand and gravel, it would seem necessarily to be inferred, that this animal must have perished in such a lake, or swamp, and that his skeleton, being thus quietly deposited, was slowly covered over in the course of the gradual formation of the vegetable layer, and that it could not have been drifted by the high waters of the river from another and older position to be re deposited upon the arrow-head at a period later than that in which the Mastodon lived [41]

Dr. A Wislizenus, president of the Academy, was quite unconvinced by Koch's account of his findings, and on March 8, 1858, read a paper in which, by a now familiar means, he attempted to explain away Koch's arguments and evidence.[42] Dr Wislizenus' paper could well serve as the type specimen of the attitude which is defined in the expression "I'm from Missouri!"

At the meeting of the Academy held on April 5, 1858, Koch made the following reply·

> Dr. Koch stated, in relation to the bones of Mastodon discovered by him in Gasconade Co, in 1839, and referred to by Dr Wislizenus in the paper read by him, at a late meeting of the Academy, that, at the time when he made the discovery alluded to, he had been fully aware of its importance, and, accordingly, had taken care to preserve all the bones, (of which fact Dr W seemed not aware,) as well those which were partially burned as those which were unburnt, all the weapons and other objects mentioned in his published paper, consisting of two stone axes, several stone spears, and arrow-heads, all bearing evidence of the action of fire, and, also, portions of the wood cinders, charcoal, and ashes, samples of the clay in which the animal had been mired, and of the black alluvium by which the bones had been covered afterwards,—and that they were now in the Royal Museum of the University of Berlin, where any person might examine them They had been exhibited, soon after their discovery and exhumation, in St Louis, in Philadelphia, and in London, where they had attracted the attention of the late Drs. Harlan and Morton, Sir Charles Lyell, and other distinguished scientific gentlemen.
>
> Concerning the arrow-head lying underneath the femur of the Mastodon, in Benton Co Mo, he would further state, that the place where the arrow-head had come in contact with the bone could still be discriminated by its greater whiteness, the remainder of the bone's surface being of a brownish color Dr K exhibited a profile section of the deposits cut through in the excavation at this locality He observed further, that, so far as he knew, only five skeletons of *M giganteus* had thus far been discovered, the bones of which had not been so far separated and scattered as to preclude their being brought together again and arranged so as to form a completely articulated skeleton Of these five, one had formerly been exhibited at Peale's Museum, in Philadelphia, there was one in Baltimore, one on the continent of Europe; the skeleton found in Benton Co., Mo. (now in London); and, lastly, that of the late Dr. John C. Warren, in Boston, Mass.[43]

It will be observed that in his reply Koch refers to the remains of the animal found at Gasconade County in "1839" as belonging to a mastodon. The description he gave of those remains fits the ground sloth, and by no stretch of the imagination can it be made to fit the mastodon. This is one contradiction which has escaped Koch's critics. It may possibly be reconciled if we assume that to Koch a ground sloth was as good as a mastodon!

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[40] G C, Swallow *The First and Second Annual Reports of the Geological Survey of Missouri.* Jefferson City, 1855

[41] Koch, *op. cit.*: 63–64.

[42] A. Wislizenus. Was man contemporaneous with the mastodon? *Trans. Acad. Sci. St. Louis* 1: 168–171, 1858.

[43] Journal of the Proceedings, April 5, 1858. *Trans. Acad. Sci. St. Louis* 1 (2): 116–117, 1860.

Rising to the support of Koch

> Mr [N.] Holmes remarked, touching this subject, that he did not agree with Dr Wislizenus that it could be considered "a hasty and thus far unwarranted supposition that Man had existed contemporaneously with the Mastodon" Nor could the *M. giganteus* be considered as an ante-diluvial rather than a post-diluvial animal Properly speaking, there had been no such geological era as a diluvial period Diluvium or marine drift and alluvium or fresh-water drift had been common to all geological periods since there had been land above water This subject had been amply illustrated by Prof Hitchcock (Surface Geol [44]) Prof R Owen, of London, had expressed the opinion (Brit Fos Mam) that it was negative evidence only that excluded Man from the Pliocene fauna of the British Isles [45] Pictet had considered the question to be What animals inhabited Europe when Man first appeared there, and thence, at what geological epoch his origin was to be placed? And this learned author (Trait. de Palé., Vol I), admitting with other Palaeontologists, that there were, as yet, no positive proofs of the existence of Man, in Europe, during the Older Pliocene, nor as early as the great northern boulder drift of the Newer Pliocene, had nevertheless concluded, that Man had established himself in that country but a short time after that drift, the continent not having been wholly submerged, that these first inhabitants saw the cavern bears, elephant, rhinoceros, and other animals of the Older Pliocene age, which became extinct in Europe in the Newer Pliocene; and that some of them were the victims of the same inundations which had filled the caverns with the bones of these animals, human bones having been found mingled together with them in the same deposits and caves, rolled and water-worn in like manner, and in the same altered condition of their texture And this would seem to be conclusive of their contemporaneousness.[46] In America, the Rhinoceros had not been found in deposits later than the Miocene, nor the *M. giganteus* in deposits earlier than the Post-Pliocene, and this age was later than the cavern epoch Prof F S Holmes of Charleston, S C , had lately established that not only the tapir, peccary, racoon, opossum, deer, elk, and musk-rat, of species still living, but some domestic animals, also, as the horse, sheep, hog, and ox, which (so far as positive evidence went) became extinct before the arrival of the white race in America, were contemporaries with the Mastodon, Megatherium, and Megalonyx, on this continent, in the time of the Post-Pliocene deposits of South Carolina, and in this conclusion he had the concurrence of Agassiz It was very certain that neither the entire surface drained by the Mississippi, nor the whole southern portion of the United States, had been submerged under the ocean, since the Post Pliocene era, so as to cut off the stream and succession of mammalian life
>
> Professor Holmes had further expressed the opinion, that although "it has been acknowledged that the mastodon, megatherium, elephant, glyptodon, and two species of Equine genera, etc , are entirely extinct, yet the discoveries made of the remains of even some of these would indicate that they still existed at a period so recent, that, in the language of Prof Leidy, "it is probable the red man witnessed their declining existence "—(Post-Pliocene Foss., 1858) [47] It was not the purpose of Mr H to allude to the proofs, that existed, of the contemporaneousness of Man and the Mastodon on this continent, but merely to observe, that the researches of eminent Geologists seemed, thus far, to have furnished no scientific ground of objection by way of antecedent improbability against the hypothesis [48]

A novel attempt to explain away Koch's findings was made in 1875 by Dr Edward Andrews, then Professor of Surgery in the Chicago Medical College Taking courage from Dana's article he cites the testimony of Hoy against Koch, and then points out that "it is a very common thing in very dry seasons for a peat-bed to be accidentally set on fire and completely burned up. . The skeleton in Gasconade County may have been scorched in this way "[49]

So ends the story of the earliest account of the discovery of human artifacts in association with the remains of fossil mammals in North America

Neither in America nor in Europe was there apparently sufficient real interest in the possible contemporaneity of man with extinct mammals Though several distinguished scientists like Owen, Pictet, and others, had unequivocally given it as their opinion that such an association was more than likely, and Owen had gone so far as to quote a French parallel to Koch's example—without, however, any reference to the latter—of such an association, and had even given his assent to it,[50] no one of Koch's contemporaries sought to inquire further into his important discovery. Benjamin Silliman had made an effort to learn something more of Koch's discovery, the importance of which he seems at once to have understood, but he was apparently prevented from proceeding further for the good reason that no response appears to have been forthcoming to his inquiry, and he evidently failed to see Koch's pamphlets. It would also appear almost certain that Koch did not see Silliman's appeal to him in *The American Journal of Science and Arts* until years later, for Koch would most assuredly not have failed to answer that appeal in good time had he seen it.

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[44] E. Hitchcock. Illustrations of surface geology. *Smithsonian Contr. Knowledge* 9. 1–155, 1857

[45] R. Owen. *A History of British Fossil Mammals and Birds;* xxxii. London, 1846.

[46] F. J. Pictet. *Traité élémentaire de paléontologie ou histoire naturelle des animaux fossiles.* 119–124. Genève, 1844.

[47] F. S. Holmes. *Remains of Domestic Animals Discovered Among Post-Pleiocene Fossils in South-Carolina.* Charleston, S C , 1858, p 11, quoting from Leidy's letter, dated Feb 10, 1857, published in J C. Nott and G. R Gliddon, *Indigenous Races of the Earth* Philadelphia, 1857.

[48] Journal of the Proceedings, April 5, 1858. *Trans. Acad. Sci. St. Louis* 1 (2) 117–118, 1860

[49] E. Andrews. Dr. Koch and the Missouri mastodon. *Am Jour. Sci. and Arts*, ser 3, 10: 32–34, 1875

No doubt Koch had his private supporters, but in the public world of science, with the exception of the well-informed Mr Holmes of St Louis, he seems to have had very few. Since Koch's original announcement of 1839 much evidence has accumulated which in every way tends to corroborate the findings and inferences of Koch establishing the contemporaneity of man, ground sloth, and mastodon in North America.

In 1846, some seven years after Koch's discovery, there was found at Natchez, Mississippi, part of a human pelvic bone together with the remains of the ground sloth, mastodon, and other extinct animals. Though not completely substantiated, the claim remains probable [51] The best substantiated discoveries, for the most part, belong to the present century Reference may be made, to name but a few, to the discoveries at Potter Creek Cave, California, in 1904;[52] at Vero, Florida, in 1915;[53] and at Melbourne, Florida, in 1923 [54] In all these cases human artifacts were found together with the remains of ground sloths and mastodon, while at Vero some human bones were actually found associated.

In 1935 J. T. Sanford described a find of mastodon remains in association with human artifacts. The find was made in the fall of 1930 some 2½ miles SE. of the town of Cromwell, in Noble County, Indiana, on the site of a dried-up pond at a depth of two feet Here, as in the example of Koch, the remains had been exposed to fire Sanford's conclusion is of interest. He writes, "Possibly the Richmond mastodon was killed by a band of primitive hunters Driven, perhaps for days, prodded by stone pointed darts and finally harassed by fire, he sought refuge in a little pool."[55]

The account of the Richmond mastodon reads almost like a duplicate of Koch's discovery. Interestingly enough a similar discovery has been reported from Ecuador by Max Uhle, in which human artifacts were found together with the remains of a mastodon which had itself been exposed to fire [56]

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[50] Owen wrote "There is evidence that the great *Bos primigenius*, and the small *Bos longifrons*, which date, by fossils, from the time of the Mammoth, continued to exist in this island after it became inhabited by man" And in a footnote adds. "Both the Urus (*Bos primigenius*) and the *Bison priscus* appear to have been contemporary with Man in the North of continental Europe Their skeletons have been found, with that of a large variety of Rein-deer which existed in Germany in the time of Tacitus, in a bog in Scania by Professor Nillson, and are preserved in the Museum at Lund My friend Mr. Murchison writes to me. 'This Urus is most remarkable in exhibiting a wound of the apophysis of the second dorsal vertebra, apparently inflicted with a javelin of one of the aborigines, the hole left by which (offering its larger orifice towards the head of the Ox, and the smaller orifice towards its rump), was exactly fitted by Nillson with one of the heads of the ancient stone javelins collected and described by that excellent Naturalist, in his Work, entitled *Skandinaviska Norden's Ur-Invånare*, Lund, 1843 This instrument fractured the bone and penetrated to the apophysis of the third dorsal vertebra, which is also injured The fractured portions are so well cemented that Nillson thinks the animal probably lived two or three years after The wound must have been inflicted over the horns, and the javelin must have been hurled with prodigious force.'

"I am much disposed to assent to this interpretation of the wound of the great extinct Ox. It is hard to conceive how such a wound could have been inflicted by the horn of another Urus; but, in interpreting these evidences of primeval hostility, the combative instincts and pointed weapons of the Ox and Deer-tribe, are always to be taken into account." (Richard Owen. *A History of British Fossil Mammals and Birds*, xxxiii. London, 1846.)

[51] For the best account of many similar discoveries made in the nineteenth and twentieth centuries see E. H. Sellards, "Early Man in America" (*Bull. Geol. Soc. America* 51 373–432, 1940).

[52] W. J. Sinclair. The exploration of Potter Creek Cave. *Univ California Publ. Am. Archaeol. and Ethnol.* 7: 107–131, 1904.

[53] E. H Sellards. On the discovery of fossil human remains in Florida in association with extinct vertebrates. *Am. Jour. Sci.*, ser. 4, 42: 1–18, 1916.

[54] F. B Loomis. Artifacts associated with the remains of a Columbian elephant at Melbourne, Florida. *Am. Jour. Sci.*, ser. 5, 8: 503–508, 1924.

[55] J. T. Sanford. The Richmond mastodon. *Proc. Rochester Acad. Sci.* 7: 137–156, 1935.

[56] M. Uhle. Späte Mastodonten in Ecuador. *Proc. Twenty-third Internat. Cong. Americanists, New York, 1928:* 247–258.

From Patagonia and the Straits of Magellan Junius Bird has also published evidence of the contemporaneity of man with ground sloth and the extinct horse.[47]

In 1926 there was discovered, some 8 miles west of Folsom in New Mexico, a flint projectile point, of a peculiar fluted character, imbedded in the matrix between two ribs of an extinct bison. This discovery gave a considerable stimulus to the study and field investigation of the problem of the antiquity of man in North America. Since then many similar discoveries have been made[48]

It is of the greatest interest, therefore, to note that Koch was probably the first discoverer of such points. In this connection the Chief of the Bureau of American Ethnology, Mr. M. W. Stirling, has written the senior author a letter which, by his kind permission, we are able to quote here

> In the winter of 1927–28, a few months before I came to the Bureau of American Ethnology, I was at the Cosmos Club in Washington in a small group which included Prof W H Holmes, Mr Neil Judd and Dr. Walter Hough The Koch mastodon remains for some reason came up for discussion. Professor Holmes recalled that when he made a visit to the Missouri State Historical Society, he was shown a projectile point which they told him had been found by Koch with the mastodon remains. The distinctive feature of this point, said Holmes, was that it had a concave base and that a long flake had been struck from the base on either side passing longitudinally beyond the middle of the point; in short, that it was what we would now describe as a fluted point.
>
> I am quite certain that at this time Professor Holmes had never heard of the Folsom finds. I was particularly impressed by the description because I had seen not long before a small article by Figgins describing the original Folsom find Unfortunately, I do not remember the date of Professor Holmes' visit to the Missouri State Historical Society nor the name of the person who showed him the point. My impression is that it was probably some time in the 1890's.

The existence of this point—which up to the time of writing has not been traced—more than anything else, increases the probability that Koch actually found human artifacts in association with both the ground sloth and the mastodon. An additional evidence of his veracity in this matter is his account of the Indian traditions relating to the mastodon Since Koch, at the time of his original publication, had been in America less than five years it is unlikely that he became familiar with the earlier accounts of such traditions Here, too, his story seems to have been received with the same incredulity as was his account of the discovery of the artifacts

To conclude, it is the tragedy of such men as Koch that even when they speak the truth they are not believed, hence when they make a discovery of real importance their claims are either completely disregarded, or else viewed with extreme suspicion Koch was scientifically untrained, an aggressive traveling showman, and a dealer in his fossil exhibits. That he was an able and indefatigable collector was a virtue of his which attracted very little attention. Scientists were outraged by the grotesqueness of his reconstructions, and by his practice of selling his specimens for considerable sums of money, principally to foreign museums. Doubtless there were other qualities which brought Koch into disrepute; but whatever Koch's faults may have been, a reexamination of his claims to have discovered human artifacts in association with mastodon remains, reveals that it is highly probable that he not only made such a discovery but that, although he was unaware of the character of the animal at the time, he discovered such artifacts together with the remains of the ground sloth, *Mylodon harlani*. Finally, it is probable that some of the artifacts found by him were of Folsom or Folsomoid type.

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[47] J Bird Antiquity and migrations of the early inhabitants of Patagonia. *Geog Rev* 28 250–275, 1938

J. Bird Before Magellan. *Nat. Hist* 41. 16–18, 77–79, 1938.

J. Bird and M. Bird. Human artifacts in association with horse and sloth bones in southern South America. *Science* 86. 36–37, 1937.

[48] For an account of the original discovery, see J D. Figgins, "The Antiquity of Man in America" (*Nat. Hist* 27: 229–239, 1927). See also Edgar B. Howard, "Evidence of Early Man in North America" (*Mus Jour.* [Philadelphia] 24: 53–158, 1935), and F. H H. Roberts, Jr., "Developments in the Problem of the North American Paleo-Indian" (*Smithsonian Misc. Coll.* 100: 51–116, 1940).

THE NOVEL OF NINUS AND SEMIRAMIS

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ABSTRACT

Among the numerous and important mosaics discovered during the last few years, thanks to the excavations directed by Princeton University at Antioch-on-the-Orontes, a small panel brought to light from the ruins of a house of Daphne, the famous summer resort of Antioch, and now exhibited in the Museum of Historic Art in Princeton, shows a very peculiar representation On it a young man sits in his bed and beholds a portrait, in front of him a woman standing near another bed offers him a cup. The interpretation of the mosaic is facilitated by its resemblance to another mosaic recently discovered at Alexandretta, and bearing an inscription designating the figure as Ninus represented on it The mosaic is not an illustration of the earliest legend of Ninus and Semiramis which seems to have spread along the shores of Ionia, as early as the fifth century B C., but of a Hellenistic novel, of which only scanty fragments are preserved in a couple of papyri This interpretation is confirmed by the subject of a second mosaic discovered in the same house of Daphne, which depicts a scene from another Hellenistic novel this time determined by the inscriptions of the two figures represented· Metiochos and Parthenope We have before us, consequently, the ruins from a house of an ancient lover of literature, who decorated its pavements with mosaics representing some of his favorite reading. This kind of representation is very rare among the mosaics preserved to us Another imposing specimen was recently discovered by the Belgian Expedition at Apamea in Syria

THE Museum of Historic Art in Princeton possesses a small mosaic, of rather poor artistic quality but interesting for its rare and obscure representation, which seems very startling indeed at first sight It was discovered in 1936, during the excavations directed by Princeton University at Antioch-on-the-Orontes and in its environs, and more precisely at Daphne, the famous summer resort of the Syrian metropolis, situated near the idyllic Falls of the Orontes.[1] This mosaic was discovered, as have been many, by chance because of agricultural work almost at ground-level, among scanty architectural remains, and without association with any other archaeological materials useful for its dating and for the determination of the building to which it belonged. The building reveals at least two periods of construction The floor of the room with which we are concerned was almost exactly in a line with a second room, separated from the first by a wall, the floor of which was also adorned with a figured mosaic placed at the level of the other, the chief axis of which, however, formed an angle of 90 degrees with that of our mosaic, with its base turned toward the southwest, while the former had the base turned toward the southeast But the outer, or northeast, side of our mosaic had been destroyed because of the superposition of a later mosaic belonging to a wide room partially overlapping the room to which the early mosaic belonged The later mosaic shows a geometric decoration, with a central portion made up of a large star of squares and lozenges around an octagon containing four solids in perspective For stylistic reasons, which would take too long to explain here, we may assign the earlier mosaics to a date around A D 200, while the second construction must have followed less than a century later

The mosaic at Princeton formed the small *emblema* in the center of the pavement, and was surrounded by several decorative borders, namely a narrow straight band, a broad rinceau with light tendrils and flowers on a black-blue background between two rows of brown crow-step, a band of waves and three broad straight bands of different colors On the upper left corner of the room a small panel of marine animals was introduced into the plain white ground of the mosaic, perhaps to serve as the floor of a small water-basin within the room, or for some other specific use of this part of the room which we cannot determine. Four fishes are alternated here with a shrimp, a clam, and a Triton's shell. The rinceau has small white and pink four- or five-petalled flowers at the ends of the scrolls; a pinkish ribbon is wound about the calix, green leaves are alternated with whitish-gray tendrils; and in the center of each tendril is a large flower or a fruit like a pomegranate.

The *emblema* is fragmentary on the lower left

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[1] The site is exactly determined by the excavation symbols Daphne-Harbie 26-O/P See on the mosaic and its discovery. *Bull. Dept. Art and Archaeol. Princeton University*. 9, fig 3, 1937; Campbell, *Am Jour. Archaeol.* 42: 213, fig 9, 1938; *Antioch-on-the-Orontes* 2. 203, pl. 78, no. 100, Princeton, 1938; C R Morey, *The Mosaics of Antioch:* 34 f., pl XII, 1938.

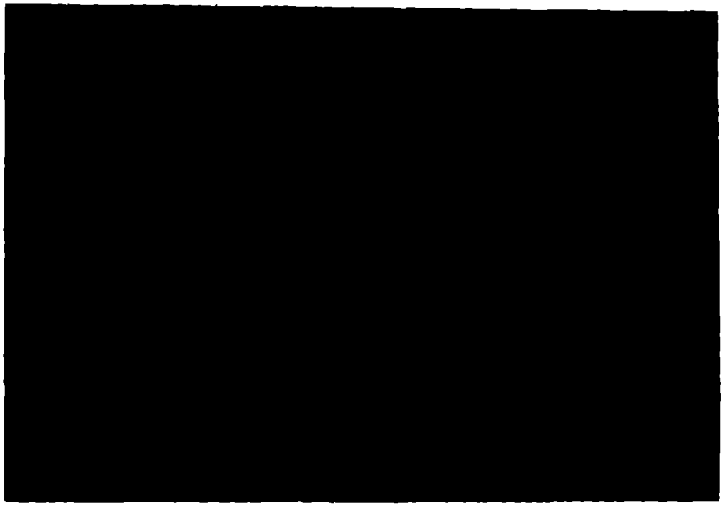

FIG 1 Ruins of the "House of the Man of Letters", general view of excavation Antioch-on-the-Orontes

corner, and lacks only a narrow band along the right edge It represents part of a bedroom, where two beds are placed at right angles. The beds seem to be specified as belonging to the furniture of a bedroom (*lecti cubiculares*) because each of them is provided not only with a high head (*fulcrum*) but also with a side-rest rising up against the wall (*pluteus*), which dining-room couches (*lecti tricliniares*) do not have[2] It is noteworthy, furthermore, on our mosaic that, besides the *fulcrum*, a high footboard rises at the foot of the bed. This detail appears also on some other monuments, among which we may mention another mosaic from Antioch,[3] where the bed is provided with a *pluteus* as well, and, even more conspicuously, in a Pompeian fresco[4] where Abundantia reclines on a kline, this time lacking the *pluteus*. In this fresco the height and slenderness of the supports of the bed are characteristic; this is also the case, to an even higher degree, in our mosaic This is a peculiarity of Roman beds of an early age, as numerous passages by Roman writers inform us A stool or a small ladder was used to get into this kind of bed, by leaning them against the *sponda*, that is the open side toward the center of the room[5]

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[2] The disposition of the beds, furthermore, does not correspond to that of the couches in a triclinium, since the *imus lectus* of the triclinium, on which our figure would be reclining, ought to be placed not on the side but before the end of the central couch partially reproduced on our mosaic

[3] *Antioch-on-the-Orontes* 2: pl. 46, no. 61, panel A.

[4] S. Reinach, *Répertoire de peintures grecques et romaines* (Paris, 1922): 151, fig. 2.

[5] *E g*, Servius, in Vergil *Aeneid* iv 685 *lecti antiquorum alti erant et gradibus ascendebantur* On the shape and the varieties of Roman beds, see Marquardt-Mau, *Das Privatleben der Römer*, ed 2 (in Marquardt and Mommsen, *Handb der röm Alterthümer* (Leipzig, 1886) 302, 724), H Blümner, *Die röm Privataltertümer* (Munich, 1911) 112 ff (in Iwan Müller, *Handb der kl Altertumswissenschaft* 4, Abt. 2, Teil 2) Blümner (*op cit.* 113) tries to demonstrate, not very convincingly, that *sponda* was used for the whole surface of the bed, and not only its unprotected edge looking toward the center of the room Anyhow, in very early times the edge without parapet is by this name clearly distinguished from those with a parapet. On late monuments, however, beds of a type similar to that of our mosaic appear also in representations of banquets. *e g*, in the category of the so-called funeral banquets, on numerous relief stelae, among which we may cite several specimens from Italy (Carducci, *Bull dell'Impero Romano* 8, appendix to *Bull della Commissione Archeol Comunale di Roma* 65. 8 ff, figs. 2–6, pl I, 1937). See besides the relief with a dead woman reclining on her bed on the well-known sarcophagus from Simpelveld (*Jahrb. d. deutsch. Archäol Inst.* 48, Anzeiger: 56 ff, Beilage I, fig. 2a, 1933) Similar beds appear as well on tomb mosaics, *e. g.*, on the mosaics in the Sfax Museum (R. Massigli, *Mus. de Sfax*, pl V, 3, 1912) See also the similar ones, but with a single parapet, all along the walls of an ovoidal space, on the mosaic from a large *oecus* in Carthage representing a gay festival, with a concert in the center of the scene (*Inventaire des Mosaïques de la Gaule et de l'Afrique* 2. Tunisie, no. 806, plate).

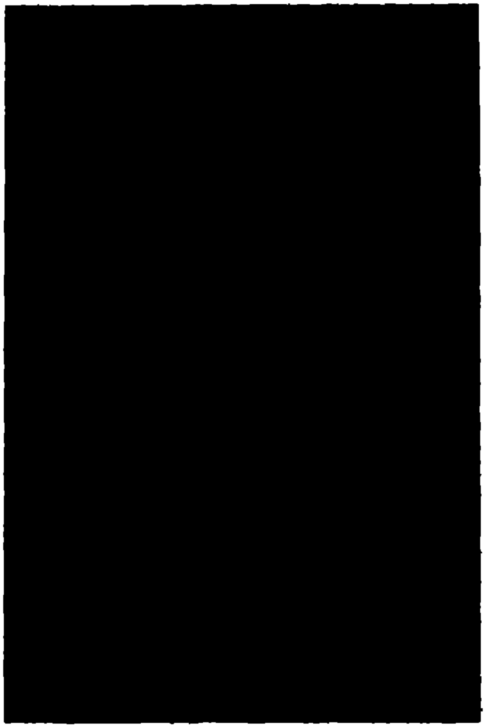

FIG. 2 Mosaic of Ninus and Semiramis. Princeton, Museum of Historic Art

An interesting representation of one of these beds—provided with *fulcrum* and with *pluteus* but not with a parapet at the foot—with the small ladder leaning against it, is that in the scene of the suicide of Dido in the Vatican Vergil.[8]

One of the two beds in our mosaic is fully represented as if seen in a three-quarters view from within the room, and shows a figure reclining on it. The three parapets are grayish, the high moulded supports are yellowish The mattress (*torus*) on which the figure rests is yellow-brown with groups of dark coffee-colored parallel bands; similar bands adorn transversally the roundish head-pillow (*cervicale*), the top of which is indicated by a whitish spot. The figure wears a white tunic adorned with two vertical *clavi*, originally probably in light blue glass *tesserae* which left only some traces in their deep furrows. The tunic sleeves reach the elbows. A violet mantle is superimposed on the tunic on the left shoulder and covers the waist and the legs. The figure looks like a youth, with short hair, and holds in his outstretched right hand a small rectangular portrait, on which the bust of a girl is depicted, with waving curls on the nape of the neck and with the hem of a dark garment below the neck The youth's left hand protrudes from the folds of the mantle and rests near his waist. On the section of the second bed represented we can distinguish a small part of the violet mattress, beneath this, the *sponda* of the bed is indicated by alternate blue and gray *tesserae* In the center of the room a girl stands before the reclining youth; her body is almost in full face, her head turned in a three-quarters view, and her eyes are staring into space. She wears a long blue tunic with black borders and bands, of which the glass *tesserae* have mostly fallen away It seems that the tunic was fastened only on the right shoulder, around the left arm probably the folds of a violet-pinkish mantle, of which a fragment is preserved near the left side, were wrapped. The naked right arm was stretched forward, presenting a cup to the youth The *tesserae* of the cup have also fallen off. The pavement of the lower part of the room where the girl stands is rendered by a broad blue band between two thin gray-coffee-colored lines; it is white on the rest of the mosaic. The features of the two figures are roughly sketched, and have a rather stolid appearance. To the daring attempt at a perspective representation of the interior of a room, the artist's capacity in space-rendering does not correspond. The parapets of the beds, instead of diminishing, widen with the increasing distance; the posts are aslant. The headboard of the fully represented bed is distorted in order to leave room for the representation of the adjoining part of the other bed. The head of the latter seems bent toward the inner side instead of being vertical. The legs of the reclining figure could not be contained in the short space granted by the perspective of the end of the bed

A small deterioration of the mosaic in front of the youth's head has been restored in antiquity with five big white *tesserae* carelessly set in.

Our study of this mosaic must be concise and provisory: the primary key to its interpretation is provided in fact by its resemblance to another mosaic, discovered at Alexandretta and preserved in the Museum of Antioch The subject of the latter mosaic is determined by an inscription The interpretation by Seyrig—who established the similarity of the two monuments[7] —as Ninus mourning over the death of Semiramis while contemplating her portrait, cannot, however, be entirely accepted The historical Semiramis, the wife of the Assyrian king Samsi-Hadad V, undoubtedly survived several years the premature death of her husband. She probably kept the regency between 810 and 806 B C until the accession to the throne of her young son Hadadnirari IV; she seems to have participated in the government even thereafter for a long time, and to have largely contributed to the prosperity of the state, thanks to her warlike enterprises as well as to her celebrated building activity. In a similar way the legendary Semiramis, the wife of Ninus the founder of Nineveh, in all the different versions of her legend is always referred to as having survived her husband's death.[8] But in the representation of our mosaic there can be no question of the original redaction of the legend. This seems to have spread along the shores of Ionia as early as the fifth century B. C., and to have been known probably to Herodotus, it was transmitted to us by Diodorus (ii 1 ff) following Ctesias' version of the beginning of the fourth century B. C It seems very likely, on the contrary, that our mosaic preserves for us a unique representation referring to a novel—one of the earliest Greek novels, probably still belonging to the first century B. C —based upon the ancient legend, and of which only a few fragments in some Berlin and Florence papyri have reached us [9]

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[8] *Fragmenta et picturae Vergiliana Codicis Vat. Lat. 3225* (*Codices e Vaticanis selecti* I, ed. 2) (Rome, 1930): pl. 40, pict. 26.

In the novel the story of Ninus and Semiramis has undergone a new and radical transformation, nevertheless, persons and elements of the old legend are still recognizable. Ninus is called by name; his beloved in the preserved fragments is mentioned only as the *κόρη*. But she is called the daughter of Derkeia, and the latter is easily identifiable with Semiramis' mother in the legend, the Syrian goddess Derketo, who is said to have exposed the daughter born to her of her relations with a Syrian man. The baby was miraculously nourished by doves. Furthermore, in the novel Ninus' war expeditions are subsequently narrated

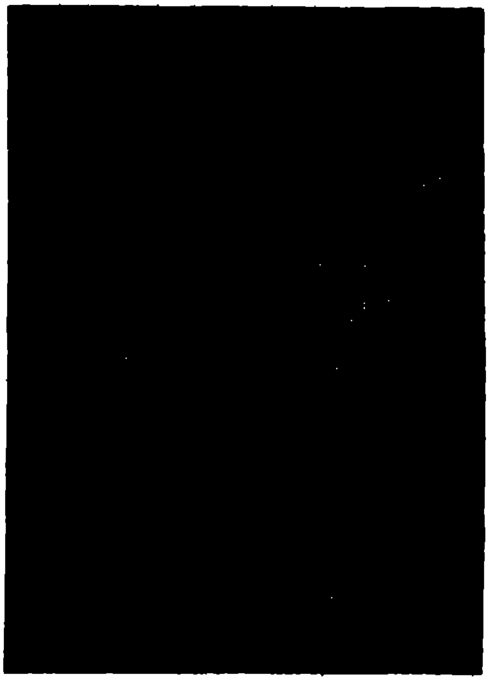

FIG. 3 Mosaic from Alexandretta: Ninus holding a portrait. Museum of Antioch

FIG. 4. Detail of figure 3.

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[7] As formulated in Campbell, *loc cit*

[8] It suffices to quote on this subject the compendious articles by Lehmann-Haupt, s. v. Semiramis, in Roscher's *Lexikon der griech. u röm. Mythologie* 4: col. 678 ff., and by Th, Lenschau, s. v Semiramis, in Pauly-Wissowa, *Real Encyclopädie d. class. Altertumswissenschaft*, Suppl. 7 col. 1204 ff., 1940, on the legend of Semiramis, col. 1207 ff

[9] Wilcken, *Hermes* 28: 161 ff., 1893, F. Zimmermann, *Griech.-Roman Papyri* (Heidelberg, 1936). 13 ff A small fragment in Florence was to be published by G. Vitelli in *Papiri greci e latini* 12, which unfortunately has not yet appeared.

at length, especially those against Armenia, which rest on a solid historical basis. The liveliest survival of the legend of Semiramis can be found in Armenia; the old name of Van itself was "Semiramis' City," and various strongholds of that country are still known by the name of "town of the girl," in which we may perhaps recognize a trace of the name of the "κόρη" of our novel.

From the two principal fragments of papyri the plot of the novel may be reconstructed somewhat as follows. Ninus and his little cousin Semiramis have grown up together in the royal palace, and from their daily intercourse a love has blossomed which the two children swear will be everlasting and exclusive Ninus' love is submitted to a hard trial because of a first separation, but in spite of all opportunities of sin, multiplied by his regal rank, he remains pure and faithful to the memory of the beloved girl In the first of the two fragments we are confronted with the scene in which the king, a youth seventeen years old, makes his peroration to Derkeia in order to be immediately bound in marriage to his sweetheart, in spite of the fact that she is merely fourteen years old, and consequently against the custom which usually forbade girls to be married before the end of their fifteenth year. In this particular case, however, reasons of state, the impending wars to be led by the king and the dangers to which he will be exposed, justify the transgression of common usage At the same moment Semiramis approaches Ninus' mother trying to obtain her consent to the marriage At the beginning of the second, and very defective, fragment, appears to have been described a pathetic scene of the sorrow and jealousy of Semiramis, a young wife by now, because of the approaching separation from her beloved husband. Ninus, perturbed and moved himself, tries to console her, if not by concealing the dangers of war, at least by assuring her that his fidelity, which did not waver before the marriage, will hardly waver now. Next morning the hero departs for the camp He defeats Armenia, moves against Egypt, and brings peace to his kingdom. During these prolonged enterprises the life and faith of the youth are often jeopardized; but he surmounts every trial according to his promise, while his wife lives in anguish, without news of him, and exposed to various temptations.

The plot of this short story reveals a quite peculiar character, different in several points from that of most other Hellenistic novels. It rests upon a historical basis; love is not the sudden result of a fortuitous meeting, but the fruit of long intercourse and of mutual inclination. Nor are fortuitous and aimless the adventures and wanderings of the hero, but dictated by high political and ethical reasons, the woman does not seem to follow her beloved in his travels, but to remain within the domestic walls waiting for his return In the small fragments preserved to us we do not find any situation which might specifically refer to the episode depicted on our mosaic. Many such situations, notwithstanding, which the scene of the mosaic might fit perfectly well, can be imagined from the content of the story The mosaic might represent the moment of the sorrowful farewell of the two consorts, in which the offer of the wife's portrait would specify the token of her faith; or it might allude on the contrary to a proof of Ninus' faith, either during the first separation before the marriage or during the second one at the time of his war expeditions, against the easy temptations of other love affairs. In this latter case the contemplation of the portrait of the beloved one as a support for the tempted faith would reveal to us a new and very effective artistic device

But the correctness of our interpretation of the Princeton mosaic as a scene from the novel of Ninus and Semiramis seems to me confirmed beyond any possibility of doubt by the fact that the mosaic of the adjoining room of the same house of Antioch represented a scene from another novel, this time identified by the inscribed names of the two protagonists, the novel of Metiochus and Parthenope [10] A few small bits of this novel have been recently added to the single fragment known to us before, and a few parts of the plot are accessible.[11] It refers to the Siren Parthenope, the patron deity of Naples, and reveals consequently, as a common element with the novel of Ninus and Semiramis, a mythological substratum. But the connections between the two novels may have been closer than they appear to us now because of some elements which are lost. As a matter of fact—further

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[10] G Hanfmann, *Am. Jour. Archaeol.* 43: 242 ff., fig 5, 1939. The mosaic, now in Worcester, has been published also in *Worcester Art Museum Annual* 2: 14, fig. 15, 1936–37; The Dark Ages, *Worcester Art Museum Exhibition*, no. 2, 1937; *Antioch-on-the-Orontes* 2: pl 78, no. 99.

[11] See Zimmermann, *op cit.*: 52 ff., and his translations in *Die Antike* 11: 296 ff., 1935.

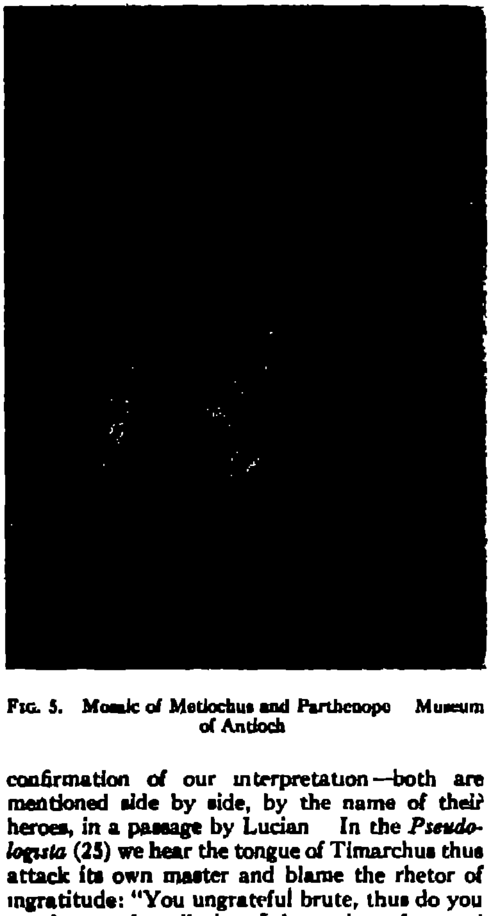

FIG. 5. Mosaic of Metiochus and Parthenope Museum of Antioch

confirmation of our interpretation—both are mentioned side by side, by the name of their heroes, in a passage by Lucian In the *Pseudologista* (25) we hear the tongue of Timarchus thus attack its own master and blame the rhetor of ingratitude: "You ungrateful brute, thus do you requite me for all that I have done for you! You were a poor devil, not knowing which way to turn, when I helped you to bread and applause on the stage, by making you now a Ninus, now a Metiochus, now an Achilles."[12] For the rest, the story of Metiochus and Parthenope seems to follow much more closely than that of Ninus and Semiramis the usual scheme of Hellenistic novels. Metiochus seems at first—as so many other young heroes of Greek mythology—averse to Eros and unwilling to listen to him, denying power and his very existence Later, on the contrary, conquered by Parthenope's love, he appears struggling to overcome the obstacles to their marriage, especially the opposition by Parthenope's father, who is a king and does not consent to the marriage because of Metiochus' modest origin Travels and adventures, such as Parthenope's capture in Corcyra and her rescue, are episodes leading to the happy end of triumphant love

The episode represented in the Antioch mosaic may well refer to the first part of the novel, when Parthenope endeavors to allure to herself the still reluctant hero Obviously, the illustrators of these late literary compositions, when facing the new situations of their subjects, could not resort to the repertory of classical and Hellenistic art for the representation of the whole scene, but were often obliged to adjust from that repertory figures and attitudes in such a way as to meet their requirements In the scene from the novel of Ninus and Semiramis we have noticed at least the introduction of some quite new elements, as well as a daring conception in the arrangement of the scene itself For the representation of the episode from the Metiochus novel, on the contrary, two standing figures are simply grouped in a usual conversation scene, and to one of them —the girl with a hand stretched forward with the open palm—is given one of the most usual gestures to express the excitement of a speaker.[13]

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[12] *Τὰ μὲν πρῶτα ἐν τοῖς θεάτροις εὐδοκιμεῖν ἐποίησα, νῦν μὲν Νῖνον, νῦν δὲ Ἀντίοχον εἶτα μετὰ μικρὸν Ἀχιλλέα τιθεῖσα.*

[13] I do not see any sound reason to interpret this mosaic as a theatrical representation. A more or less dark band on the bottom of the scene does not mean a stagelike podium and can be seen as a pavement also on the second mosaic of the same house, where, as we said before, it cannot be a question of a stage representation, as well as elsewhere in the Antioch mosaics. In the costumes of the figures no characteristic theater garments appear. I would add, furthermore, that I am not convinced of the existence of any certain information about a play on the subject of the novel. The passage in the dialogue *Pseudologista* by Lucian which we quoted above refers to a rhetor His personifications of the most different rules such as that of Ninus, Metiochus, Achilles, made him famous and made out of him a popular educator. Consequently, these performances on the stage may very well have been of a rhetorical character, such as lectures, or readings of passages of his own works. We know how much the fashion of an author reading his own writings and lecturing in every kind of public places, in porticoes, baths, and theaters, spread throughout the Roman world, especially after the readings by Asinius Pollio (see L. Friedländer, *Sittengeschichte Roms*, 10th ed by G Wissowa (Leipzig, 1922), 2: 225 ff). Even less persuasive, as regards the existence of a pantomime on our subject, is a second passage by Lucian (*De Saltatione*, 2) In this dialogue, in which Lucian defends this kind of theatrical performances, his opponent Craton begins by asking how it is possible for a serious and learned person to attend such shows, in which an effeminate man, wearing soft garments, recites lascivious songs and imitates enamored females

In spite of every difficulty, however, recent discoveries confirm that subjects from fiction and historical novels[14] were welcomed into the repertory of late Roman mosaics, especially in the eastern provinces. We may mention among the most recent and not yet exhaustively investigated discoveries the interesting mosaic from Apamea in Syria,[15] much larger and more comprehensive than our two Antioch mosaics. Here a man in warlike costume embraces a woman in front of a palace, while merry girls in floating garments and veils are carolling and dancing in a chain around them The inscription Θεραπενίδες (θεραπαινίδες = the little servant girls) led Cumont to the ingenious and very likely interpretation of the scene as an anecdote referred to by Clement of Alexandria (*Protrept.* ii 31 1 f , ed. Stählin (Leipzig 1905). 23, 306), whose author was Myrsilos of Lesbos. Megaklo, the daughter of Makar, King of Lesbos, succeeded in stopping the endless rows of her parents by buying some Mysian slave girls, whom she taught dancing and music, and who succeeded with their arts in calming the irascible king. In gratitude for this, Megaklo, who in her Aeolic dialect had called the Mysian slaves (*Μυσάς*) "Muses" (*Μοίσας*), dedicated a cult to the Muses in her town. In the case of the novel of Ninus and Semiramis, the introduction of its subject into the repertory of the Antioch mosaics would be even more plausible, if we accept the attribution of the novel itself to the author proposed by Lionello Levi: a certain Xenophon from Antioch, about whom we are informed by Suidas that he wrote a novel called Βαβυλωνιακά,[16] a title perfectly suitable for the story whose protagonists are Ninus and Semiramis.[17]

As regards iconography, our mosaic is one of the monuments in which a picture, and in our case more precisely a portrait, is introduced as an element of representation into a painting or a mosaic. The *pinax* held by Ninus in his right hand[18] looks like a small picture with the four sides of the frame crossing each other and protruding in small angles outside the painting's corners Such are often the frames made to hold on the sides the hinges of the *pinakes* provided with folding leaves used to close and protect the painting Similar specimens are often represented in Pompeian frescoes as hanging from the walls: we may mention among others the *pinakes* on the walls in the house of the Vestals and in the tridinium of the Crypto-porticus.[19] The frame may present this shape also in pictures where there are not, or at least not indicated, the folding leaves. We may point out an example in the small picture leaning against the pedestal

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of antiquity, "like the Phaedras, the Parthenopes, the Rhodopes" (*θηλυδρίαν ἄνθρωπον ὁρῶν, ἐσθῆσι μαλακαῖς, καὶ ᾄσμασιν ἀκολάστοις ἐναβρυνόμενον, καὶ μιμούμενον ἐρωτικὰ γύναια τῶν πάλαι, τὰς μαχλοτάτας Φαίδρας καὶ Παρθενόπας, καὶ Ῥοδόπας τινάς,*). First, it is not necessary to assume that here it is a question of the Parthenope of our novel a scholiast (*Schol. Dionys. Perieg.* 358. *Geogr gr. min.*, ed. C. Müller (Paris, 1861) 2: 445) explicitly affirms indeed the existence of another and entirely different Parthenope, from Samos, who wandered throughout the world because of her ardent love for her husband Anaxilaos. In any case, the plural of the names used by Lucian indicates, in itself, an expression like "types of Phaedras, Parthenopes, etc," not referring to a specific play, but using them as examples of women popularly famous for their luxury The mimes would imitate their attitude for any kind of recital, much as modern night-club entertainers may imitate, to amuse the public, the gestures and words of historical persons, of heroes of novels and stories which are the best sellers of the moment, as well as of any kind of famous living person.

[14] And analogous literary compositions as well; we may mention the probable illustration of one of the fables by Babrius in a recently discovered mosaic from Tebessa (ancient Theveste) in Algeria (L. Leschi, *Mélanges d'archéol. et d'histoire*, École fr. de Rome, 41: 99 ff., 109 f., pl. I. 1924). We cannot linger here over the much discussed question whether the episodes of the story of Eros and Psyche, frequent in the Antioch mosaics, are derived from Apuleius' novel or not.

[15] See F. Mayence, *Bull. des Musées royaux d'art et d'histoire* (Brussels): 98 f., figs. 1 and 3, 1938.

[16] Ξενοφῶν Ἀντιοχεύς, ἱστορικός· Βαβυλωνιακά· ἔστι δὲ ἐρωτικά (Suidas, *Lexicon*, ed A Adler (Leipzig, 1933), 3 498, 23). See L. Levi, *Rivista di Filologia* 23. 19, 1895

[17] The title of Ctesias' work containing the earliest version of the legend of Ninus and Semiramis was Περσικά, its first book, the one containing Semiramis' story, was known also by the special title 'Ασσυριακά.

[18] Glanville Downey (*Church History* 10: 376, 1941) interprets the scene of our mosaic as a symbol of Plotinus' doctrine concerning the way in which the souls beheld images of themselves in a mirror. There seems to me to be little likelihood of such a representation in our small *emblema*, as against all the probabilities of a scene from a novel which we have pointed out, and which are supported by the subject of the second mosaic discovered in the same house. Furthermore, the shape of the object held by the figure in the mosaic does not seem suitable for a mirror Square mirrors, sometimes even without a handle, can be found in Roman times (*e. g.*, in the frescoes of the Villa of the Mysteries in Pompeii—see A. Maiuri, *La Villa dei Misteri*, pl. XIII, 1931); their frames, however, strong and usually clearly of metal, never show the crossings on the corner, suitable on the contrary for the wooden frame of a *pinax*.

[19] G. E. Rizzo, *La pittura ellenistico-romana* (Milano, 1929): pls. XXXIII and XVI. *Cf.* other specimens, *e. g.* in Daremberg-Saglio, *Dictionnaire des antiquités grecques et romaines*, s. v. Pictura, 4: 464, figs. 5651–5652.

of a herm of Dionysos in the painter's atelier represented in a well-known Pompeian fresco,[20] in which the woman artist has copied precisely the figure of the herm itself, in the same fresco[21] a second picture with an identical frame hangs from the door-jamb. Ateliers of artists, such as that of the painter we have mentioned above, would obviously be the normal motivation—we may say perhaps the only one previous to our mosaic—for the representation of "paintings within paintings." Such is, *e. g.*, a second Pompeian fresco where a woman artist is busy painting the image of a man standing before her on a canvas which a companion keeps straight for her on a table.[22] And such is again the parody of a painter's atelier in a third Pompeian fresco,[23] where, instead of human beings, dogs are depicted. In the latter we meet for the first time a man's head or bust on the pinax resting on its easel, in all probability the portrait of the figure who poses, sitting in front of the painter. The most comprehensive representation of an artist's atelier is that on a stone sarcophagus of Kerch in Crimea, dated approximately in the first or second century, of which, strangely enough, the interior was painted on all four sides. The scene of one side[24] presents a painter of encaustic funeral portraits seated in his atelier, intent on his work, in front of a cupboard containing paints, which has both door panels open and rests on a small column. Behind this a portrait stands on an easel. On the wall hang three finished portraits, a square one between two round medallions. The square one, as well as the portrait on the easel, shows the same kind of frame as that on our mosaic. Again we have a bust in a picture resting on the easel in a funerary relief, discovered in the Roman Campagna.[25] It represents the usual farewell of two consorts, but one in which the wife holds in her free hand a paintbrush, which characterizes her as a painter, standing near the instruments of her art. Among the mosaics, furthermore, as regards a painter's atelier, we may mention only the *emblema* from the Garden of Maecenas preserved in the Antiquarium Comunale in Rome, in which a similar subject has been, very plausibly, recognized by B. Schweitzer, but which seems to have been slightly modified in the copy by the mosaicist.[26] According to this interpretation an artist sits here, idealized and in heroic nakedness, seen from his back before his easel. In the right hand a female figure of mythological nature appears, probably a personification of the artist's inspiration. An object leaning against his seat would have been originally a pinax, which was transformed however by the mosaicist, as a tribute to his own art, into a mosaic panel seen in perspective. But the representation of a man looking at a portrait held in his own hands is a new one, which appears for the first time in the Antioch mosaic. It may be that the scenes of a lover contemplating the portrait of the beloved girl, or even love arising from the sight of a portrait of an unknown girl, were among those adopted by the Greek novel from its oriental sources, where such devices as portraits, dreams, were necessary because of the secluded life of women.[27] And late Hellenistic painting, following its general trend, may easily have been spurred by a favorite theme of the new literary genus, to produce this most suggestive among its idyllic motifs.

POSTSCRIPT

Thanks to the kindness of H. Seyrig, former Director General of Antiquities in Syria, we were able to secure for this paper two photographs of the Alexandretta mosaic, which arrived from Beyrouth just before the paper went to press. We wish to thank M Seyrig for his effort in procuring the photographs as well as for his permission to publish them (figs. 3 and 4).

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[20] *Museo Borbonico* 7. pl. III; Reinach, *Rép. peintures* 262, fig. 8.

[21] The frame of the figured *emblemata* of mosaic-floors sometimes imitates this kind of frame for paintings, being formed by four plain lines crossing at the corners of the picture: this device was specially cherished in Antioch, where it appears on a great number of mosaics from the early second century to the end of the third century. It is not restricted, however, to Antioch: we may mention, *e. g.*, a well-known mosaic with Nilotic scenes, discovered on the Aventine and preserved in the Museo Preistorico Luigi Pigorini in Rome (Reinach, *Rép. peintures:* 377, fig. 1) (for its figured panel see also Rizzo, *op. cit.*, pl. CLXXXVII).

[22] Th. Schreiber, *Kulturhistorischer Bilderatlas* 1, *Altertum* (Leipzig, 1885). pl. IX, 3; Reinach, *op. cit.* 262, 9.

[23] Reinach, *op. cit.:* 161, fig. 6. The painting reproduced by O. Jahn ("Über Darstellungen des Handwerks u. Handelsverkehr auf antiken Wandgemälden," *Abhandl. d. phil.-hist. Classe d. k. sächsischen Gesell. d. Wissenschaften* (Leipzig) 5, fasc. 4: pl. V, fig. 6a, 1868) seems to be an incorrect drawing of the same fresco.

[24] See M. Rostovtzeff, *Antique Decorative Paintings in South Russia* (in Russian) (St. Petersburg, 1913–1914): 376 ff., pl. XCII, 1; also in *Jour. Hellenic Studies* 39: 144, fig., 1919.

[25] P. S. Bartoli, *Gli antichi sepolcri* (Rome, 1768). frontispiece-vignette; O. Jahn, *op. cit.:* 300 ff., pl. V, fig. 8, Daremberg-Saglio, *op. cit.*, s. v. Pictura, p. 465, fig. 5656. In all probability the relief is original, but its inscription is forged.

[26] *Corolla Ludwig Curtius* (Stuttgart, 1937): 35 ff., pl. 2; *cf.* M. E. Blake, *Mem. Am. Acad. in Rome* 17: 102, pl. 20, fig. 4.

[27] See E. Rohde, *Der griechische Roman und seine Vorläufer*, ed. 3 (Leipzig, 1914): 53, note 4.

The photographs show that the resemblance between the Antioch and the Alexandretta mosaics, because of the latter's fragmentary state, extends only as far as the principal figure is concerned, which is also the only one whose name is here preserved: Ṇινος. The youthful aspect of this figure, with round cheeks and short hair, well corresponds to that of the Antioch mosaic, but he holds the portrait not while reclining on a couch, but sitting on a chair with moulded legs. The resemblance of the two monuments is, however, quite sufficient, together with the other arguments previously advanced, to support our interpretation of the Antioch mosaic.

THE TIME FACTOR IN CHROMATOPHORE RESPONSES

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(*Read April 23, 1943*)

ABSTRACT

It has been suggested by Hogben and especially by Neill that chromatophores respond quickly, in 10 minutes or less, to nervous stimulation and slowly, in 2 hours or more, to hormonal stimulation. This distinction was based on comparatively few examples. When a wider range is considered, it is found that some nervously controlled color-cells are slow in response and some controlled by hormones are quick. This evidence is unfavorable to the suggestion of Hogben and of Neill and in favor of the view that nervous stimulation and hormonal stimulation are in reality the same in nature in that both are dependent upon secreted substances, neurohumors.

BEFORE 1915 all animal chromatophores were believed to be controlled exclusively by nerves. In 1918 Redfield showed that in the horned toad *Phrynosoma* the melanophores responded not only to nerves but also to the hormone adrenaline. In 1922 Hogben and Winton demonstrated that in the frog nerves played little or no part in melanophore control, which was accomplished by the pituitary secretion now known as intermedine. In 1928 Perkins pointed out the complete ineffectiveness of nerves for the control of chromatophores in shrimps and showed that the color-cells in these animals were made to concentrate their pigment by a hormone that emanated from their eye-stalks. In many animals, however, it could still be demonstrated that nerves were of great importance as chromatophore activators, and an important problem in this field was the determination of the part played on the one hand by nerves and on the other by hormones in the color changes of particular animals.

In following these lines of investigation, Hogben (1924) was impressed by the importance of a time factor in chromatic activities and was led to conclude that in the responses of color-cells, reactions induced by hormones took more time than those excited through nerves. This general conception was supported by the further work of Slome and Hogben (1929) and was assented to by a number of workers, including Smith and Smith (1935), Vilter (1937), and others. Hogben's view finally took more definite form in the hands of Neill (1940), who declared that "when the total time taken for colour change exceeds two hours hormonal co-ordination is indicated. On the other hand, a total change time of the order of 10 min or less may be safely held consistent with predominantly nervous co-ordination, through the direct innervation of the melanophores themselves." Thus fairly definite limits were set for the two kinds of chromatic activation. How consistent is this view with what is known of the lengths of time required for color changes in different animals?

A considerable number of records of the times necessary for chromatic animals to change from pale to dark or the reverse is scattered through the literature. The more accessible of these records have been brought together in table 1. Here the names of the vertebrates concerned are given in the left-hand column, arranged under chief headings and with the species under each heading in the sequence of increasing time of response. The second column includes the names of the observers of these conditions and the dates of their publications, and the third and fourth the times recorded by these observers for the color changes, pale to dark and dark to pale. The actual times are given in seconds, minutes, hours, or days. The body of the table is made up of records for melanophores, but it ends with three readings for erythrophores. I know of no corresponding readings for xanthophores.

Of the 24 species of vertebrates whose melanophore reaction-times are recorded in table 1, 19 changed from pale to dark more quickly than from dark to pale. Four (*Scyllium*, *Tautogolabrus*, *Gasterosteus*, and *Anguilla*) were recorded to have made one of these changes in the same time as the other, and one (*Lebistes*) required more time to change from pale to dark than from dark to pale. The occasion of these conditions is not wholly clear. Almost every chromatic vertebrate darkens from the presence in its blood of the pituitary neurohumor intermedine, which may be supplemented in this activity by acetylcholine. Acetylcholine is a very ephemeral substance and

TABLE 1

RECORDED INSTANCES OF TIMES OF MELANOPHORE AND ERYTHROPHORE CHANGES FROM PALE TO DARK AND DARK TO PALE, SHOWN BY CHROMATIC VERTEBRATES

Animal Species	Authors	Time	
		Pale to Dark	Dark to Pale
MELANOPHORES			
Elasmobranchs			
Mustelus canis	Parker and Porter, '34	0.5–2 hr.	2 d
Scyllium canicula	Waring, Landgrebe, and Bruce, '42	4 d.	4 d
Teleosts			
Mollienisia latipinna	Pierce, '41	10–25 sec	25–50 sec.
Fundulus heteroclitus	Pierce, '41	45 sec.	1 min.
" "	Parker and Brower, '37	1 min	2 min
Salmo salar	Neill, '40	30 min	10 hr
Lebistes reticulatus	Neill, '40	35 min.	7 min
Tautogolabrus adspersus	Hunter and Wasserman, '41	50 min	50 min
Gasterosteus aculeatus	Hogben and Landgrebe, '40	1 hr.	1 hr
Ameiurus nebulosus	Parker '34	1 hr	3.5 hr
Parasilurus asotus	Matsushita, '38	1 hr.	3.5–4 hr
Lophopsetta maculata	Osborn, '39	1 d	2 hr–2 d
Phoxinus laevis	Healey, '40	1–2 d.	5–6 d
Paralichthys dentatus	Osborn, '39	1.3 d	2–4 d
Pseudopleuronectes americanus	Osborn, '39	3–5 d.	3–7 d
Anguilla vulgaris	Neill, '40	20 d	20 d.
Amphibians.			
Bufo arenarum	Stoppani, '42	1 hr.	2 hr.
Rana clamitans	Pierce, '42	4.5–5 hr.	10–12 hr.
Xenopus laevis	Slome and Hogben, '29	15 hr.	100 hr
Reptiles:			
Anolis porcatus	Hadley, '29	1 min.	15–18 min
" *equestris*	Hadley, '29	1 min.	25 min.
" *carolinensis*	Carlton, '03	4 min.	25 min
" "	Kleinholz, '38a	6 min.	30 min
Lophosaura pumila	Zoond and Eyre, '34	4 min.	slow
Chamaeleo vulgaris	Brücke, '52	Few min.	0.5 hr.
Phrynosoma blainvillii	Parker, '38	15 min.	30 min.
ERYTHROPHORES			
Teleosts:			
Prionotus strigatus	Lee, '42 (exc. pallor)	10–15 sec.	2–4 sec.
Holocentrus ascensionis	Smith and Smith, '35	10 sec.	5 sec.
" "	Parker, '37	16.5–22 sec	4.5–8.5 sec.

will disappear from the body fluids of an animal in a short time. Intermedine on the other hand is a relatively stable material and can be found in the blood of such an animal as the catfish 70 hours after that creature has been deprived of its source for this substance, the pituitary gland (Osborn, 1938). It is therefore not improbable that the slowness shown in the blanching of many chromatic vertebrates, as contrasted with the quickness of their darkening, is due to the retention of intermedine in their circulating fluids, a state which would prevent for some time the effective action of such a blanching agent as adrenaline. That this is not the whole explanation of this slowness, however, is seen in the fact that retardation in blanching is clearly observable in *Fundulus* (compare table 1), which is one of the very few fishes whose melanophores are very irresponsive to intermedine (Kleinholz, 1935). Notwithstanding this exception, the slowness of blanching as contrasted with darkening, which appears to be common to so many animals, may well be an aftereffect of intermedine.

In table 1, under erythrophores, are recorded the time-records of these red color-cells in two species of fishes. In the records here given the times for the color changes are the reverse of the usual ones for melanophores. In both the fishes noted the change from pale to dark requires more time than that from dark to pale. The activating neurohumors for erythrophores are as yet unknown. Possibly after they have been discovered an especially efficient one will be found that will act as a counterpart of melanophore intermedine in that it will activate vigorously the change from dark to pale instead of from pale to dark. In that case the residue of this material may well slow down the action of a darkening neurohumor. However, too few records for erythrophores are known to allow this suggestion to be more than tentative.

When the melanophore time-intervals for elasmobranchs and amphibians in table 1 are inspected, they will be seen to be relatively long in that they are measured in hours or even days, in reptiles they are of shorter duration—mostly some minutes, but in teleosts they are very diverse, ranging from the shortest of all melanophore records, 10 seconds, to the longest of all, 20 days. This last record, the time of change for the eel both in darkening and in blanching, is truly remarkable and stands out in strong contrast with all other records tabulated. It is probably not fairly comparable with what remains in the table, for it is reported by Neill to have been taken in water at approximately 8° C. It is well known that at this temperature melanophore activity falls off very considerably. Wykes (1938) states that at 6° C. the color activities of *Ameiurus* are at almost full abeyance. It is therefore probable that the long time-interval for the color changes in the eel, as reported by Neill, is due to the temperature at which his work was done. At 8° C. the responses of melanophores must be greatly slowed down as compared with what they are at 18° to 20° C., the temperatures at which many of the other records contained in table 1 were made. Before leaving this general survey, it may be well to mention that for shortness of time none of the melanophore periods reach the extremes shown by the erythrophore records, pale to dark, which range from 8.5 to 2 seconds.

How are the time-intervals in table 1 related to the melanophore activating systems, humoral and nervous? This question cannot be answered with any fullness, for these systems are insufficiently known except in a limited number of the tabulated species. However, certain general comparisons are possible. Although there are very few time-intervals recorded for the color changes in elasmobranchs, it is common knowledge that these fishes are unusually slow in such responses and are predominantly humoral in their melanophore activation. The same condition prevails among amphibians (table 1). On the other hand, in some fishes such as *Fundulus*, whose chromatic activation is almost purely nervous, the chromatic time-interval may be very short. It is occurrences such as these that doubtless influenced Hogben and others in their belief that humoral responses are slow and nervous responses rapid. Is this view substantiated by further comparisons?

As Waring remarks (1942), the uniformity in chromatic behavior met with in elasmobranchs and in amphibians is not to be seen in teleosts and in reptiles. Had this lack of uniformity in these two groups been subjected to critical examination by Waring and by Neill, these investigators would probably have reached different conclusions from what they did. Among teleosts slow chromatic responses, such as occur among amphibians and especially among elasmobranchs, are found in the eel (Neill, 1940), flatfishes (Osborn, 1939), and *Phoxinus* (Healey, 1940). In all these fishes darkening occurs in a day or more, which is well above the two-hour limit set by Neill and therefore indicative of humoral control. Yet all the fishes named give evidence of the nervous activation of their chromatophores. Waring (1940) states that in the European eel the melanophores are directly innervated, a statement that I can confirm from my own observations on the American eel. I feel fully assured of this conclusion notwithstanding the fact that in a subsequent publication Waring (1942) makes what appears to be a qualified denial of his first declaration. Comments have already been made in this communication on the very long chromatic time-period ascribed to the eel by Neill, but even if we suppose this period to be much shorter than that reported, this fish undoubtedly belongs to the slow type and yet it is endowed with chromatic nerves. If the eel is possessed of both nervous and humoral control over its melanophores, as is presumably the case, the early steps in color change should be nervous and the later ones probably both nervous and humoral. Such an interpretation would agree well with the plotting for this fish given by Neill (1940, fig. 3). In this instance slowness does not appear to be inconsistent with nervous control. The flatfishes studied by Osborn (1939) also are slow in response, and though the total number of their chromatic activators has not yet been determined, they certainly include an adrenalinelike hormone and at least one set of nerve-fibers, a plan of chromatic organization not wholly unlike that in the eel. Here again slowness of response and innervation occur together. The European minnow *Phoxinus* is also a fish of the slow type, its color changes requiring from one to several days. Its chromatic organization has been worked out by Healey (1940), who has found evidence for not only an adrenalinelike hormone but also for concentrating nerve-fibers. Thus all the fishes discussed in this paragraph exhibit two very significant features, they are beyond all doubt members of the slow type of color response and yet all possess chromatic nerves. These moreover are commonly associated with a chromatic, blood-borne hormone. Such conditions are not favorable to a view in which nerves are regarded as the occasion of rapid chromatic responses.

Animals recorded in table 1 and whose melanophores show rapid responses are the teleosts *Mollienisia* and *Fundulus* and the lizards *Anolis* and *Chamaeleo*. In all these the pale to dark changes require some seconds or at most a few minutes. In no instance does a record reach 10 minutes, the top limit set by Neill for probable nervous coordination. The chromatic organization of *Mollienisia*, whose melanophores show the shortest period of response of those in any fish in the table, has never been determined. It is therefore impossible to state whether this fish possessed only chromatic nerves or color hormones or a combination of both. In *Fundulus*, which is also a rapid fish, it is well known that hormones play little or no part in its normal color changes, which are brought about by almost purely nervous agencies. Here then is a good instance where, as has already been stated, rapid response and nerve action are associated. Among the lizards, however, the situation is by no means so simple. In the chameleons, whose type of color response is rapid, chromatic nerves are known to be activating agents, but there is no conclusive evidence to show that hormones such as intermedine may not also be significant factors in the changes of these animals. Of the three species of *Anolis* recorded, all belong to the rapid type. Of these, *Anolis carolinensis* has been very fully worked out by Kleinholz (1936, 1938*a*, 1938*b*), who has shown in a most conclusive way that chromatic nerves are completely absent from this form and that the one color activator present is intermedine. On the discharge of this neurohumor into the blood of this lizard, it quickly darkens, and with the disappearance of this agent from its circulation the creature more gradually becomes green, its pale phase. It would be difficult to imagine a better example of a rapid chromatic vertebrate the exclusive activating color agent of which is a hormone. Thus the lizards include rapid hormonal as well as rapid nervous examples.

In addition to the two types of color responses defined by Neill as rapid and slow, there is certainly at least one other which has received no consideration from this investigator and yet this type is a perfectly obvious one. It is a type whose time period is of a length between the limits of 10 minutes and 2 hours as defined by Neill, and which is represented in table 1 by such animals as the fish *Ameiurus* and the lizard *Phrynosoma*, not to mention other forms. In *Ameiurus*, whose darkening requires about an hour and whose blanching takes a little over three hours, the chromatic activators are at least three: two darkening agents, cholinergic nerves and the hormone intermedine, and the blanching adrenergic nerves (Parker, 1940). In *Phrynosoma* the activators are also three, the darkening agent intermedine, and the two blanching agents, concentrating nerves and a hormone probably adrenaline (Parker, 1938). Hence nerves as well as hormones are involved in the chromatic organization of both these examples. In *Ameiurus* nerves are active in both changes, and yet these changes require more time than the corresponding ones do in *Phrynosoma*, in which nerves are involved only in the change from dark to pale. It is difficult to understand what Neill would do with such intermediate instances as these, for they fail to fit into his classification in any satisfactory way. Perhaps it is best to leave them out of consideration altogether, as in fact he does.

This discussion of the chromatic conditions exhibited by the vertebrates recorded in table 1 shows how difficult it is to come to a sound conclusion as to color changes and their activators in these animals. That there is truth in Hogben's contention that nervously controlled color responses are quicker than those under hormone influences can be shown experimentally. Thus if a blanched catfish with a blanched caudal band is put in a black-walled, illuminated vessel and allowed to darken, it will deepen in tint for an hour or so till it has reached a reasonably dark shade. Ordinarily in such a process the body of the fish and the caudal band darken at the same rate, but not infrequently the band lags behind the body for some 15 minutes or so, after which the band catches up in tint with the body and proceeds farther at the same rate with the body as a whole. In no instance does the band darken more rapidly than the body. The darkening agents in this fish, as already stated, are two, the dispersing nerves and the hormone intermedine. Evidently in the catfish, since the innervated body often darkens before the denervated caudal band, the darkening nerves must precede in action for a short time the darkening hormone, which after a quarter of an hour or so invades and darkens the denervated band. Thus Hogben is justified in concluding that in color changes nerve action may be more rapid than hormone action. But this is far from justifying Neill's declaration that a chromatic time-interval of the order of 10 minutes or less implies nervous co-ordination, and of 2 hours or more, hormonal co-ordination. Instances from table 1, already quoted and discussed in this communication, render this statement highly improbable. What is shown by such a display as that in table 1 is that melanophores in particular animals are in their times of response extremely diverse and are not controlled in these time-periods by one or other of the assumed two types of activation, nervous and hormonal. As can be seen well under the teleosts, these time-periods form a graded series, extended from extremely rapid instances to extremely slow ones and without evidence of a division into a rapid group and a slow group. This implies a diversity among melanophores which is not often kept in mind, for these color-cells are too commonly regarded as uniform in character. In this respect the term melanophore is somewhat misleading. That it included diverse types of cells can be shown from the fact that the intermedine contained in commercial pituitrin is very effective in dispersing the pigment in the melanophores of *Ameiurus*, yet has little or no influence on that in the melanophores of *Fundulus* (Kleinholz, 1935, Abramowitz, 1937). Thus melanophores in different vertebrates must be differently constituted, a fact which in my opinion lies at the bottom of their varying times of response to given activators. This feature in melanophore stimulation is probably of much greater significance in determining the chromatic time-interval than the way in which the melanophores are activated. This view of the situation makes it clear how one activator such as intermedine or adrenaline can elicit such diverse responses from the melanophores of different vertebrates. The term melanophore is somewhat like that of muscle, which included a variety of types ranging from the slow-acting smooth muscle such as is seen in a snail's body to the extremely quick cross-striped muscle in an insect. In fact, the melanophore of *Phoxinus* may well be compared to the smooth-muscle elements of a snail, and those in *Mollienisia* to rapid insect muscle. From this standpoint rapidity and slowness in melanophore action depend upon the nature of the melanophores concerned, and though activation of color-cells by nerves may be slightly more rapid than by hormones, the differences in time-intervals for melanophores, as shown in table 1, are very much more matters of the organization of the color-cells themselves than they are of their methods of activation.

This view of the time factor in melanophore response is in harmony with the recent advances in what is known of melanophore stimulation. As has been implied throughout this contribution, the distinction between nervous and hormonal activation of color-cells lacks soundness. Chromatophore excitation by nerves and by hormones is after all a single type of operation, for in both cases it is dependent upon the direct action of stimulating substances on the color-cells. In some instances these substances are produced by the nerve terminals in the given animal, and in others by glands of internal secretion. These substances, which have been termed chromatic neurohumors, are the real activators of the color-cells and their sources are quite secondary. In fact one of them, adrenaline, appears to come in some instances from nerves and in others from glands. Thus the distinction between nerve and hormonal activation tends to disappear, to give place to a unified plan of neurohumoral activation common to the nervous system in general.

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PHYSIOLOGICAL TIME

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(Read April 23, 1943)

SINCE immemorial ages man has felt the necessity of measuring time. Fortunately there are certain sense impressions which in our experience repeat themselves, identical to themselves, and which correspond, on an average, to the same routine of consciousness. The alternation of day and night has been employed since the beginning of the history of man to register approximately the same sequence of sense impressions. A day and a night became the measurement of a certain interval of consciousness.

This early method was improved in the course of centuries but basically it has remained very much the same. We rely, today, on the regular motion of the hands of our clocks, because we know that this motion is regulated by the motion of the earth around the sun. Assuming, moreover, as a result of astronomical experience, that the intervals, day and year, have a constant relation, we can throw back the regulation of our clock on the motion of the earth about its axis. We may regulate what is termed the "mean solar time" of an ordinary clock by an "astronomical time," of which the day corresponds to a complete turn of the earth on its axis.

And we admit that equal rotations correspond to equal intervals of consciousness. But this is entirely arbitrary, since we have no means of checking the perfect regularity of our timekeeper. If the earth were gradually to turn more slowly upon its axis, how should we know it was losing time, and how measure the amount? We cannot assert that the hour, today, is the same interval as it was a thousand, or perhaps a million years back. Why should a year now represent the same amount of consciousness as it might have done a few million years back? The absolutely uniform motion by which alone we could reach an absolute measurement of time, fails us in perceptual experience. It is, like the geometrical surface, reached in conception, and in conception only, by carrying to a limit the approximate sameness and uniformity which we observe in certain perceptual movements.

On the other hand, we are permitted to think that, from the point of view of our senses and our consciousness, things can be different according to whether the cycle of existence is longer or shorter and according to whether the rhythm of the reactions is more or less accelerated. The value of time is different for a short-lived insect and for man, and we know that time "seems" to flow much more rapidly as we grow old. Have we any scientific proof that this is a mere delusion comparable to well-known sense delusions, or does it correspond to a biological reality? It is this question which I shall presently try to answer.

As a consequence of extensive experimental research begun during the war of 1914–1918, we were able to show that the rate of cicatrization of wounds varied as a function of the age of the patient and of the dimensions of the wound. We succeeded in obtaining a simple mathematical formula in which one single coefficient expressed this double relationship. We called this coefficient the index of cicatrization and attributed the symbol i to it.

In later years, when we were struck by the possible import of the existence of a physiological time, distinct from physical time, we realized that, in order to study the problem conveniently, it would be necessary to eliminate the influence of the size of the wound so as to deal with an element depending on age alone. We finally obtained such a coefficient in a very simple way, and we termed it the "constant of physiological activity of reparation." It is related to the index of cicatrization in a very simple manner:

(Constant of physiological activity of reparation) $A = i\sqrt{s}$, s being the surface of the wound expressed in square centimeters.

Now this coefficient A varies very rapidly with age, in animals as well as in human beings. Its mean values, computed from a large number of human cases (about 600), are:

Ages:	10	20	25	30	32	40	50	60 years.
$A =$	0.400	0.260	0.225	0.198	0.188	0.144	0.103	0.08

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 5, MAY, 1944

It will be seen at once that it decreases very rapidly at the beginning of life, then more slowly as man becomes older. It is five times larger at the age of ten than at the age of sixty, which means that a wound of, say 25 square centimeters, or roughly 4 square inches, which will take about 30 days to heal on a man twenty years old, will heal in 20 days on a boy of ten, and will require 100 days on a man of sixty

Moreover, we were able, by experimenting on cold-blooded animals (mostly alligators), to show that the rate of cicatrization depended, as almost all chemical reactions, on temperature, the higher the temperature (up to about 100 degrees Fahrenheit), the quicker the process. The temperature coefficient is very close to that of Van't Hoff. Therefore, it can be stated that the phenomenon of cicatrization is basically a chemical phenomenon, but the reactions which take place at the age of sixty are, at the normal temperature of 98 6° F, five times slower than at the age of ten

What does this exactly mean? *It means that at different ages it takes different lengths of physical time to accomplish the same amount of work*

Now, time can be measured by an amount of work performed just as well as by a velocity, provided we are reasonably sure that the speed remains constant But we have just demonstrated that the rate of cicatrization varies greatly in the course of a lifetime, this phenomenon cannot, therefore, be used as a means of measuring time On the other hand, we must remember that the standard time we are using is borrowed from the inanimate world It is an arithmetical time But, there is no obvious reason why we should rely on this conceptual time for measuring a living time, the time of organisms which are born and which will die. All our reality is comprised between a cradle and a coffin. The pace of our cellular life is more important to us than the eternally indifferent rhythm of the stars, our own chemical clock really measures our human time. We only know the outside world through the inside image built up in our brain by means of the reactions of our nerve cells We are aware of the relativity of things outside of us. Why should we measure the pace of our reactions by means of a pure conceptual time? If we decide to interchange our standards and to measure the *physical* time by comparison with the *physiological* standard, we will find that physical time flows much more rapidly towards the end of life than at the beginning, and that, instead of flowing arithmetically, it flows logarithmically like that of radioactive atoms.

Is it not a fact of common experience that, as we stated at the beginning, time passes more rapidly as we grow old? Could it not be that this were not a delusion but a scientific, measurable fact? Careful experiments showed this to be true The experimental work has been repeated and checked in this country by Professor Hoagland *Our appreciation of the rapidity of the flow of time depends just as cicatrization does, on the Van't Hoff coefficient of temperature* Thus the proof has been afforded that we possess inside of us a chemical clock which sets the pace of one of the most fundamental physiological activities, that of the reparation of tissues, and also determines the rhythm of our psychological activity.

Since our early experimental work, other facts have been brought forth which show definitely that time manifests itself in living organisms by the slow accumulation of toxins in the blood Thus we have a general idea of the mechanism of our chemical clock.

I have no time to go into details, but I can say that the mathematical curve which expresses the variations of the constant A is almost identical with that which expresses the variation in our appreciation of the value of time based on a purely psychological test, namely, the fact that, to a baby five years old, one year represents one-fifth of his whole existence, while to a man of fifty, it represents only one-fiftieth. This is expressed by an equilateral hyperbola, while the variations of A are represented by an exponential formula. But between the age of 15 and the age of 80, the two curves are almost superposable. We can, therefore, with a satisfactory degree of accuracy, measure the real human value of one hour, of one day, or of one year, on the basis of the rate at which a man cicatrizes a wound at a given age, by means of the index of cicatrization or of the coefficient A.

And this shows that, at the age of sixty, five hours of our existence are equivalent to one hour of the existence of a child of ten. In other words, in the course of 60 minutes of the time recorded by our clocks, a child has lived physiologically and psychologically as much as the man of sixty would have in 5 hours.

It is not surprising, therefore, that it is difficult tb sustain the attention of a child for more than a few minutes. to him, ten minutes are worth 50 minutes of the older man, and every lecturer knows that it is hard to keep people interested for more than 50 minutes.

Parents and children live in different temporal worlds. They are separated by a gap often too large to be bridged, even by illusions. Within the familial group the individuals should not be separated by too great a temporal distance The younger a child is, the richer his life in physiological and psychical values. Such a fact should not be neglected by educators Every moment of the existence of a child must be utilized for his development A clear realization of the enormous value of physical time for children would bring about a real progress in education and in the quality of individuals.

STUDIES ON THE ARMY-ANT BEHAVIOR PATTERN.—NOMADISM IN THE SWARM-RAIDER *ECITON BURCHELLI*

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CONTENTS

Introduction	438
Results	442
Swarm raids ending in bivouac-change movements	442
Phases in the development of maximal raiding	442
Swarm raids ending in return to the same bivouac	450
Phases in the development of minimal raiding	450
Summary and discussion	452
Conclusions	457
References	457

ABSTRACT

The nomadism of *E burchelli*, like that of the previously investigated type species *E hamatum*, arises through the daily raiding forays. Colony movements when they occur are the outcome of maximal raids, consequently appearing near the day's end in both species Certain extrinsic factors, together with a low threshold of excitability in the colony, are essential When the latter condition is deficient, the raid is minimal or absent, and no bivouac-change movement appears. Light, as an extrinsic factor, not only stimulates raiding activities at dawn, but also operates inversely to account for the disappearance of raiding at dusk. The latter change is essential for the transition of raiding into bivouac change, since in the absence of photokinesis the foragers readily submit to a movement emanating from the colony center The afternoon reactivation of the colony, leading to a vigorous exodus, results from stimulative changes (probably atmospheric) supplanting conditions which retard activity through midday These changes also occur when a colony is low in general excitability, but then are limited in force, and on the basis of a minimally developed raid can eventuate only in return to the same bivouac site Thus the critical factor determining the presence or absence of nomadic movement at a given time appears to be the internal condition of the colony There is no basis for the telic hypothesis that the movement of a colony is a reaction to scarcity of prey in the zone of operations. Since the writer's theory, based upon the column-raiding *E hamatum*, is now found essentially applicable to the swarm-raiding *E burchelli* despite a distinctive difference in the predatory behavior of these species, this line of explanation may well apply broadly to the Ecitons as a group.

INTRODUCTION

From the time the intriguing phenomenon of doryline behavior first came to scientific attention (Anon , 1701), the transitory nesting and predatory activities of the legionary and army ants of this subfamily have excited wonder and speculation Unfortunately the problem long remained more than ordinarily obscure, because it abounds in inaccessible features and special impediments to systematic investigation. The characteristic elusiveness of doryline colonies led Bates (1863 358) to say about *Eciton hamatum* of the Amazons region.

> I have traced an army sometimes for half a mile or more but was never able to find one that had finished its day's course and returned to its hive Indeed I never met with a hive, whenever the *Eciton* were seen, they were always on the march.

Norton's (1868) experience was similar Belt (1874. 24–25), who had somewhat better success in finding the temporary nest or bivouac of the army ants, indicated his impression of *Eciton* transiency in the statement·

> I think that *E. hamata* does not stay more than 3–5 days in one place. They may be known by all the common workers moving in one direction, many of them carrying the larvae and pupae under their bodies.

"Here today and gone tomorrow" is a fitting characterization of doryline life

The general behavior pattern of these insects proves to be one of the most complex although stable and highly predictable group behavior phenomena known in the animal series. Influenced by all the intimate aspects of colony biology and behavior, the *Eciton* pattern of raiding and nomadic activities seems to arise dominantly through unlearned agencies with a minimal influence of habituation and learning. Few animal activity patterns confront us with the "instinct" problem in a broader and more impressively unitary manner

I have had the opportunity to undertake a systematic investigation of the *Eciton* problem as a case study in "instinctive behavior."[1] Atten-

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[1] There have been four periods of investigation, all falling within the rainy season from May through September. The main part of the work has been field observations conducted in the tropical rain forest of Barro Colorado

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, VOL. 87, NO. 5, MAY, 1944

tion at first was devoted mainly to field study of behavior in the type species, *E hamatum*, leading to a theory of the *Eciton* pattern based upon the raiding expeditions and colony movements of this species (Schneirla, 1938). This raised the question of how well a theory based upon the ways of the type species might typify the Ecitons in general. As a first step toward answering this question, the properties of mass organization in the swarm raids of *E. burchelli* have been explored (Schneirla, 1940), to reach an understanding of what is apparently the most critical species difference in the *Eciton* predatory expedition, that between swarm-raiding and column-raiding The contrast will be of assistance in the present study, which is devoted to describing and understanding the basis of bivouac-change movements in *E. burchelli*

Observations on the apparently transitory nesting and raiding behavior of the dorylines have led a number of writers, notably Lund (1831), Sumichrast (1868), Belt (1874), Müller (1886), Vosseler (1905), and Wheeler (1910), to refer to the "drivers" of the Old World and the "army ants" of the New World tropics as migratory. Probably the first to report having witnessed in *Eciton* behavior what he took to be a migration was Bates (Smith, 1855), the others mentioned above were similarly led to apply the term "migration" to given doryline activities on the basis of their own observational experience. This general practice rests upon the long dominant impression that doryline colonies move about rather freely and have no permanent abode

On the other hand, on technical grounds Heape (1931) has denied the relevancy of the term "migration" for the dorylines, advancing instead "emigration," since he believes that the colonies merely wander about, moving on when the supply of booty has been exhausted within a given area Fraenkel (1932) also, in his comprehensive review of insect migration, has expressed doubt that the dorylines are truly migratory For the Ecitons in particular, he regards the question as unsettled, as long as it is uncertain whether the ants have temporary nests merely and are constantly on the march, or have fixed nests to which they return from predatory expeditions until the vicinity is cleared of prey

It is plain that a serious difficulty exists in the interpretation of doryline behavior, apparently attributable to an insufficiency of evidence concerning the conditions under which colony movements arise More than that, a highly questionable bias has prevailed toward regarding these movements as outcomes of depleted supplies of booty within a given area

In view of the deficiency of specific evidence which long existed, it is somewhat surprising to find that writers have been nearly unanimous in favoring the hypothesis of food shortage to account for colony removals This statement of Belt's (1874 17) is representative

> Whilst the leaf-cutting ants are entirely vegetable feeders, the foraging ants are hunters, and live solely on insects or other prey, and it is a curious analogy that, like the hunting races of mankind, they have to change their hunting grounds when one is exhausted, and move on to another

A frequently cited proponent of the food-shortage hypothesis is Vosseler (1905), who observed the behavior of *Dorylus* and *Anomma* colonies ("driver" ants) of East Africa The drivers, he thought, occupy a given site until the quantity of prey available in the vicinity of the nest no longer is sufficient to feed the members of the colony, whereupon the entire population moves to a new zone of operations. The idea is offered in the following statement (p 293)

> Ist der Umkreis des Nestes abgesucht, so werden ab und zu die ersten Gebiete noch einmal durchstöbert; reicht die Beute nicht mehr zu Ernährung des Volkes aus, so muss es sich zur Auswanderung entschliessen

Vosseler seems to have been very positive about the matter, although he does not appear to have carried it beyond the status of a hypothesis supported by general impressions. In his discussion one looks in vain for evidence to show how a food shortage might translate itself into colony removal, or even for preliminary data showing that a paucity of booty necessarily exists when colony movements occur.

In essentially the same form, many secondary writers have adopted this hypothesis as their

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Island (Institute for Research in Tropical America, Gatun Lake, C. Z), supplemented by studies in the laboratory

The program has been supported at various stages by grants from the National Research Council (Committee on Grants-in-Aid of Research) and from the Bache Fund of the National Academy of Sciences I wish to express my gratitude for these subsidies, for the courtesies of the Michigan Table at the Institute kindly extended by Prof F. M. Gaige, of the University of Michigan Museum of Zoology, and for the many thoughtful ways in which the path has been smoothed by Mr James Zetek, custodian of the Barro Colorado Island laboratory and reservation explanation. The comments of Sharp (1899) and Arnold (1915), offered in connection with a taxonomic treatment of the ants, are representative. Arnold puts the matter as follows (p. 110):

> Ranging far and wide in search of prey, these ants must sooner or later exhaust the area around their nests, and are forced to remove the latter to new and more productive hunting grounds.

It is apparent that the idea of doryline colony movements being geared to the supply of accessible booty has had a wide circulation, despite its uncertain basis in fact.

A variant of this hypothesis was offered by Müller (1886), who from the study of an *Eciton burchelli* colony suggested that an increased need for food when voracious larvae were present could lead to more pillaging activity than at other times. This application of the food-supply hypothesis to the explanation of differences in *raiding* appeared to follow from his observation that when food-consuming larvae were present the predatory expeditions were large and frequent.

Of greatest interest here is Müller's differentiation between raiding activities and the colony removal. To account for the colony movement (or, in the reverse sense, for failure to move) he really offered two mutually complementary hypotheses: one of them a postulated colony food-need depending especially upon the condition of the brood, the other based upon an assumed difficulty of transporting a fertile queen. Although, as I have suggested (1938), Müller seems to have been exceptionally close to the essence of the phenomenon, he was far from reaching an explanation. Both of his assumptions are teleological, and the process of neither is self-evident from the assumptions; furthermore, the assumptions may be wrong.

In view of the lack of tangible evidence supporting the food-shortage hypothesis, I have not been greatly surprised to find my own results leading toward a rather different explanation. A summary of the findings for *E. hamatum* in the earlier part of this investigation (Schneirla, 1938) may help to clarify this issue and also serve as a background for the *E. burchelli* study.

E. hamatum may be termed a column-raider since its raiding forays, like those of certain less-known species (*e. g.*, *E.* (*Labidus*) *crassicornis*), involve the development of branching chemical trails followed by narrow columns of ants. Almost from the beginning of the raid at the first daylight one observes the growth of treelike systems of narrow trails, each having as its trunk a principal trail which lengthens as secondary trails drop out of use and new ones form progressively farther from the bivouac. From one to three of these trail systems are formed according to conditions, with the Ecitons passing along the principal trails in both directions between the bivouac and distant foraging zones.

At certain times for a succession of days the raids are incompletely developed, generally forming then only one trail system, from which the ants withdraw to the bivouac at the day's end. In contrast, at other times for days in succession a colony may regularly stage extensive and heavily populated raids, generally with three trail systems springing up afresh each day. The raiding foray is then transformed during the late afternoon into a colony removal; the entire population of the colony passing through one of the trail systems to a new bivouac site somewhere in its outskirts. It was a movement of this kind witnessed by Bates (Smith, 1855) in Brazil, an unbroken *hamatum* procession headed in a single direction, which he distinguished from predatory activities and termed a migration.[2]

Although the relationship between raiding activities and the *removal* or *bivouac-change* movement is not readily perceptible from the bare facts of behavior, the evidence for *E. hamatum* has led me (1938) to conclude that a significant relationship exists. As the following summary suggests, the development of a *hamatum* raid involves numerous events which may be regarded as prerequisite to the occurrence of a colony removal at the end. This résumé concerns maximally active raiding, which leads predictably to that outcome.

1. In *hamatum* active raiding begins with the first daylight, expanding during the morning into two or three trail systems (as compared with a single trail system when minimally active).
2. At midday there is a marked reduction in the population of the raid, and the advance of predatory activities is retarded considerably.
3. This interval of lethargy ends with a notable resurgence of new recruits from the bivouac and a general revival of vigorous raiding activities during the early afternoon.

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[2] In this paper the terms "removal" and "bivouac change" will be used synonymously for any movement of a colony from a given nesting site to a new one. The question whether the concept "migration" is applicable to *Eciton* activities will be reserved for later consideration.

4. Leaving the bivouac, ants in the new rush tend to respond differently to the three principal trails. Factors are: (*a*) a differential chemical saturation of the trunk routes (especially in booty chemical) at the bivouac, (*b*) physical factors affecting accessibility of the given route; and (*c*) interference by returning traffic with outgoing traffic.

5. Raiders returning on "non-favored" trails may pass inward to the bivouac relatively unopposed. At the home site numbers of them are drawn directly into the outward rush on the "favored" trail. Toward dusk, as raiding activities decrease, this drift becomes increasingly prominent.

6. Occupants of the bivouac, progressively excited by the activities of departing ants, thereby are drawn into the growing exodus through tactual and chemical stimulation—a "drainage" process.

7. The growing exodus blocks the return of ants from the periphery of the "favored" trail system, gradually enforcing a more complete outward orientation of traffic on the entire system. Other systems then "drain" more readily into this one.

8. The movement continues until all of the ants have been evacuated from the other trail systems and from the bivouac into the "favored" system. At some time during the night the colony settles into a new cluster at a site generally about 200–300 meters from the location of the abandoned bivouac.

These are the highlights of behavior in the biological type species, as far as group movements outside the bivouac are concerned. From these facts I have concluded (1938) that external behavior circumstances essential to the colony removal can arise only through raiding. This means that the investigation of such movements should begin with studies of the raiding process, then should advance to colony conditions underlying raiding. The first of these problems concerns us here; the latter will be considered in a subsequent article.

In order to broaden the investigation, it is desirable to find how far the described pattern of relationships existing in the type species may apply to the Ecitons in general. However, it has been neither feasible nor essential to investigate many species in turn with the object of generalizing the theory. The advisability of selecting the next step with care is apparent from this statement of Sharp's (1899: 174):

> The workers of the *Dorylini* at present known are without exception quite blind, and are believed to be all of predaceous habits; it is thought by some that they have no fixed abodes but, like the *Ecitonini*, frequently change their residence, and it has been suggested that in doing so they make use of the nests of other ants as temporary abodes, all these points are, however, still unsettled, and as there are several genera it is not unlikely that considerable variety will be found to prevail.

Thus, in dealing with the Ecitons, the temptation to generalize from a given species should be tempered by the thought that more than 100 of them are known, presenting many striking and rather perplexing behavior differences. Indeed variety does prevail, as Sharp points out, yet beneath the many striking species differences there appears to lie the common basis of a characteristic *Eciton* behavior pattern. To attack this problem most directly, it seems preferable to concentrate upon a species which differs critically in some broad aspect of behavior from the species first studied.

This calls for a wide inspection of behavior among the groups of American dorylines. One prominent difference among *Eciton* species is that some are *terrestrial*—essentially confining their raiding and bivouacking to the surface - whereas others are *hypogeal*- at least partially subterraneous in their raiding and predominantly so in their nesting. Common examples of the former are *E. hamatum* and *E. burchelli* of the subgenus *Eciton s. str.*; of the latter, *E. praedator* and *E. crassicorne* of the subgenus *Labidus*. This habitat difference, although striking, is apparently less significant for our investigation than a wide difference in raiding which impressed Bates (1863) in his observations of Brazilian species. There are *column-raiders*, whose predatory expeditions have treelike systems of narrow branching columns ending in small foraging groups, and *swarm-raiders*, whose forays are headed by relatively enormous unitary groups or swarms with a distinctive patterm of secondary columns (Schneirla, 1940). The latter species difference exhibits many striking features of evident biological importance, such as a much wider assortment of prey in the swarmers than in the column-raiders, and the far more frequent attendance of ant birds and of flies upon the former, to mention only one or two.

In view of the significant relationship between raiding and bivouac-change movements discovered in the type species, the best promise for a study of the latter phenomenon and of the group behavior pattern in general seems to lie in a comparative study of predatory activities. Accordingly *E. burchelli*, which like *E. hamatum* is terrestrial but in its capacity for massive pillaging expeditions differs sharply from the type species, offers itself as an opportune subject.

RESULTS

SWARM RAIDS ENDING IN BIVOUAC-CHANGE MOVEMENTS

Observations were carried out in detail on more than twoscore *E burchelli* raids, all of them maximally developed, ending in colony removals to new bivouac sites[3] Then the notes from these cases were sifted to discover which events were common to all, whether such events occurred in a characteristic or describable sequence, and how they might be interrelated. Collation of these results with evidence from special tests gives the following representative account of daily events, arranged to indicate the order and the manner in which major developments predictably occur under the given conditions.

Phases in the Development of Maximal Raiding

1 *The initial period of outgoing traffic.*—At daybreak there begins an exodus at first limited in scope but soon accelerating in numbers and in area covered by the radially expanding masses A raiding body or distinct swarm presently takes form and begins an advance away from the bivouac, generally keeping surprisingly well to a given direction of progress once it is under way. Within three hours (*i e* , by about 9·00 a. m) a well-populated raiding system exists, headed by a large swarm behind which a complex fan-shaped network of columns tapers down to a single principal trail leading to the bivouac. This characteristic *burchelli* raiding system is represented in figure 1

As the raid grows to great proportions, events in the forward zone become very complex The magnitude of the expedition by midmorning results in the raiding swarm and consolidation fan becoming very unwieldy and disorganized, so that in the course of time the main body divides into two subswarms and perhaps more. As a consequence of this fission of the raiding mass, there appears at the place where it occurred a major forking of the surviving principal trail, each branch trail leading to a distinct subsystem of the raid. This major change generally is recognizable at about 10·00 a. m., within 40 to 60 meters of the bivouac. In a previous study of organization in the *burchelli* raid, I have offered (1940 409 ff) an analysis of these early developments.

Since the principal trail is the sole line of communications between the *burchelli* bivouac and the raiding front, focussing attention upon its traffic conditions through the day gives the best insight into key events preceding the eventual bivouac-change movement.

2 *The morning period of mixed traffic* — Various writers and especially Bates (1863) have reported that in the main column of the *Eciton* raid one sees two trains of ants running in opposite directions. However, this holds only at given times of day. Outgoing traffic generally monopolizes this route during the first few hours of raiding At first in the *burchelli* raid, generally

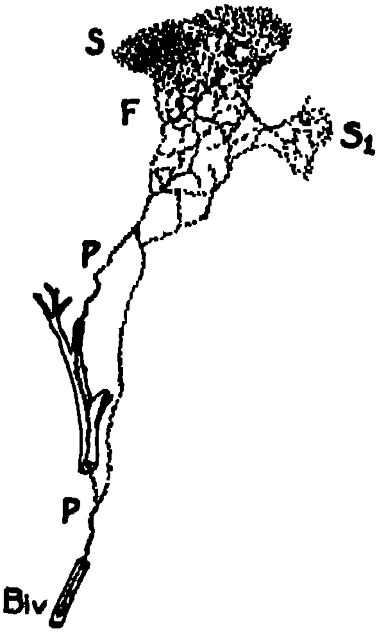

FIG. 1 Sketch of a *burchelli* raiding system made between 10.30 and 11 15 a. m., after about 5 hours of raiding. *S*, swarm (now approximately 55 meters from the bivouac, and about 12 meters wide); S_1, subswarm; *F*, fan, or network of consolidation columns; *P*, principal trail; *Biv*, bivouac (in inclined hollow log).

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[3] The term "maximal" will be used to denote predatory expeditions which are clearly superior in their development, in contrast to the term "minimal" used for those which are at a low point of development. Ordinarily the two classes of raids are readily distinguishable in the same colony at different times through external signs such as size and extent of swarms, the presence or absence of major swarm division, and the perimeter of the invaded zone at corresponding times of day This difference in *burchelli* raids was noticed by Müller (1886)

until about 9:00 a. m., few ants are seen running toward the bivouac, and those that progress any distance against the outgoing stream make their way with difficulty at the sides of the column. Then a change gradually appears. Observing events within a given section of the principal trail, one sees first occasionally and then more frequently the domination of this stretch by ants headed toward the bivouac. As the morning advances there are increasingly frequent bursts of homeward-bound traffic, with a prevalent locomotor friction between oppositely moving travellers which accounts for hectic traffic conditions. The swelling inbound movement inevitably forces travellers running oppositely, after numerous head-on encounters, to journey with difficulty at the border of the trail or to turn around.

3 *The period of predominantly inbound traffic*.—Gradually the main direction of travel becomes reversed, a change first apparent in the section of trail just behind the fan, then in time extending progressively closer to the bivouac. As a rule, the principal trail is monopolized after 11:00 a. m. and through noontime by homeward-bound ants. Booty-carriers are common after 10:00 a. m., but among them are always unladen individuals, sometimes a considerable number of them in succession. Many of these come from the raiding front, especially from groups remaining in the wake of the swarm engaged in "mopping-up" operations; large numbers of them come from short branch trails which undergo evacuation only after the main scene of pillaging has shifted to distant areas.[4]

4 *The "siesta" period*.—Through midday, generally from around 12:00 m. until well after 1:30 p. m., there is a noticeable fall in the vigor of activities at the bivouac and through the raiding system. The ants appear less energetic, raiding in smaller numbers with deficient co-ordination in their raiding masses. At the bivouac general activity falls greatly, ants move about rather torpidly, and relatively few depart on the principal trail. This "siesta" phenomenon is a highly predictable event for the midday period in general, one which is in effect rather widely among insects and other forest animals.

On the principal trail itself at this time traffic heads mainly toward the bivouac. The ants move at a steady plodding pace, unlike the rushing hectic movement of preceding hours, and relative positions in the column are not exchanged very frequently. Few new recruits pass outward into the raiding zone.

With ants departing toward the bivouac replaced by few newcomers, the general population of the raiding system shrinks during this period, with signs that the general area covered by the raid has contracted considerably. Although the subswarms continue their advance, flushing out and appropriating small life from the underbrush, circuitous and variable movement predominates instead of a direct advance of the whole body with effective co-ordination of sections as before (Schneirla, 1940: 426 ff.).

Daily, through noontime and early afternoon, the *burchelli* raid undergoes an ebbing of its vigor. Recovery from this midday period of depressed activity occurs gradually, as is the case among the forest animals generally. As it develops, the recuperation of activity in the colony leads to general behavior changes in the raid which really constitute a distinctive series of events, and demand treatment as such when their significance for the ultimate bivouac-change movement is considered.

AFTERNOON DEVELOPMENTS LEADING INTO A COLONY REMOVAL—

5 *The afternoon resurgence of activity*.—In the early afternoon, generally before 2:30 p. m., there is a pronounced general quickening of activity. Everywhere the Ecitons move in a more lively manner, at the bivouac an increased excitement is perceptible, and in outlying zones there is a greater energy in trail-running and in raiding. The renewed stir and bustle about the bivouac, reminiscent of the morning arousal, contrast markedly with the noontime lethargy preceding it.

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[4] The source of this homeward movement appears to be complex. There is no encouragement in my experience for the supposition that laden ants immediately distinguish the general direction of the bivouac—the typical variability of their initial wanderings together with other circumstances suggests that the process is very indirect. However, there is a little evidence that sometimes at trail junctions, especially near the base of the fan and on the principal trail where routes have been longer in use, booty-carriers turn more frequently into the alternative presenting the greater saturation of booty chemical—hence toward the bivouac. This may be a simple learned discrimination (Schneirla, 1940: 456 f.). There are clearer influences, such as the fact that most branch trails are directed toward the bivouac, so that for ants leaving them the bivouac-ward turn is at an obtuse angle and is physically favored, whereas the turn outward is at an acute angle and therefore opposed by the mechanics of movement.

Soon from the bivouac a stream of ants is observed which, although generally thin and intermittent at first, becomes an important factor in the raid. Once begun, this exodus continues in one or another manner through the following hours, resuming even after a heavy downpour has interrupted it. It is as though irrevocable forces were at work, compelling the bivouac cluster to expel its contents into the environs.

We shall see that this renewed outpouring of the ants furnishes the basis for a complete removal of the colony, although the manner in which it does so is generally very complicated. To understand the eventual development of a bivouac-change movement from this beginning, it is necessary to trace carefully the history of the interaction between the afternoon exodus and events on the existing raiding system.

6. *The midafternoon conflict in traffic.*—Through the "siesta" period there is continued though reduced travel on the principal trail, as a rule moving predominantly toward the bivouac. The outsurging of newcomers from the bivouac which then sets in generally breaks up the returning procession more or less, so that presently one observes that traffic conditions near the bivouac are becoming complex and variable. This conflict on the principal trail increases in time, gradually spreading to involve sections of the route farther from the bivouac. The increase in degree and extent of this traffic confusion (at times constituting a veritable "traffic jam") is due not only to the fact that swelling numbers from the bivouac take the one available route, but also to a general increase in peripheral activity which sends in larger numbers of laden and unladen ants from outlying areas. Outgoing ants collide pellmell with homegoers, the latter in turn obstructing the passage of those leaving the bivouac and breaking their column, with the result that traffic on the trunk line at this stage generally fluctuates considerably and may become very unstable.

7. *Conditions influencing the direction of the bivouac-change movement.*—The inevitable conflict between the persistent outward rush and the homegoing movement may have one of two principal outcomes, depending upon circumstances. If outgoing traffic gains the right-of-way, the colony removal develops in a very different manner than if returning traffic holds sway on the principal trail. The former possibility is the more frequently observed of the two, and will be considered first.

7a. *Conditions under which the afternoon exodus holds the principal trail.*—The afternoon egress of ants from the bivouac generally continues more or less steadily, subject to temporary interruption only by occurrences such as a torrential rain. Typically between 2:00 and 4:00 p. m. it gains an increasingly extensive dominance over the principal trail, and eventually monopolizes this route. After the initial period of mixed traffic there usually follows toward midafternoon an interval in which the outgoing procession mainly controls matters but is occasionally broken by limited numbers of returning raiders. Gradually, then, the Ecitons that succeed in working their way through to the bivouac are reduced to a mere trickle as the outgoing column begins to usurp the entire width of the trail. Subjected to a steady pelting of tactual stimuli from the outgoing procession, rising to frequent buffeting from actual bodily collisions, the homegoers are soon forced to turn back toward outlying zones where raiding continues. As the afternoon wears on, the dominance thereby effected for the outward movement on the principal trail is perceptible at progressively increasing distances from the bivouac.

The traffic conflict first observed near the bivouac is later duplicated at the first major trail division and at more advanced points. In these places also there is first a protracted period of mixed traffic, when groups running in opposite directions get through intermittently despite mutual interference.[4] Then there comes a time when the steady outward press of ants reaches a given trail-division and dominates it, so that most of the bivouac-bound traffic on branch trails is thenceforth forcibly turned back and diverted into peripheral routes. The following representative instance illustrates this development.

On the four days preceding this observation the colony in question had staged extensive raids, each terminated by removal to a new site. On August 20, when these observations were made, the colony began its foray by swarming over the skeleton of a huge fallen tree. There occurred about 10:15 a. m. a secondary division of the swarm (fig. 1), leaving a branch trail that persisted not quite two hours, and at about 11:00 a. m. there was a primary swarm division resulting in the formation of a prominent forking of the principal trail which persisted throughout the

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[4] These contests of forces at strategic trail-division points differ only in secondary ways from the "struggles" previously described for *hamatum* raids (Schneirla, 1933: 277 ff.; 1938: 72 f.).

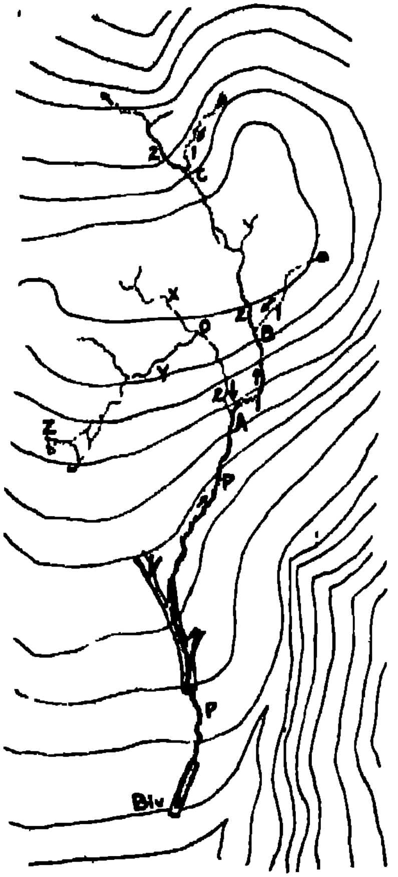

FIG. 2 Sketch of a *burchelli* raiding system (*cf* fig 1) to show conditions existing between 5.30 and 6·00 p. m., when the bivouac-change movement is well under way *Biv*, bivouac; *P*, principal trail, *A*, *B*, and *C*, successive major trail-division points on the route of the developing movement. Arrows indicate the predominant movements of traffic on the various trail segments (see text, sec. 7*a*) Minor branchings of peripheral trails are omitted. (Contour interval, 6 meters.)

day (*A*, fig. 2). This main division point, which was about 50 meters from the bivouac, furnished the principal setting of the following notes. Its outward branches *A*–1 and *A*–2 are viewed in figure 2 as the upper arms of a Y. The report begins with notes taken in midafternoon, centering upon events at junction *A*.

3:30 p. m.—After about 1½ hr. of the afternoon reactivation, ants pass from the bivouac in an almost unbroken procession, singly or two abreast at times, but mainly in a column 2–3 cm in width Along the principal trail up to the first division point *A* more than four-fifths of the travellers are headed outward.

At trail division *A* confusion prevails, with pressure from outgoing traffic mainly dominating the course of events As a result at 3 40 p m relatively few returning ants can pass this trail-junction point to approach the bivouac Many of those interrupted at the junction *A* have stopped there, forming two irregular clusters with caches of booty near by

At *A* there are only 2 or 3 shuttle trails remaining from the trail anastomosis which developed during a traffic impasse about 3·00 p. m These short trails wind across from *A*-1 to *A*-2, but at the present time are not followed by many of the ants. (Trail networks are likely to develop in *burchelli* raids when major traffic disruptions arise, through the forcing of blocked travellers in numbers from the regular routes Frequently they persist in use to such an extent that subsequent events are greatly complicated by the variable roles which their auxiliary routes may play as influences upon general traffic) In the present instance the subsidiary trail network died away without becoming an important factor in the course of events.

On branch trail *A*-1 traffic is somewhat broken at present, although short outgoing processions are predominant Trail *A*-1 has two main branches farther out at 4 00 p m branch *B*-1 leads to a tree in which foraging continues; branch *C*-1 leads to an active swarm now about 5 meters in width, with flies overhead and ant birds roundabout, and branch *C*-2 leads to an area of thicket in which a loosely organized swarm of uncertain boundaries seems to be stirring up a considerable amount of prey

On branch trail *A*-2 at 4 10 p m traffic moves predominantly toward junction *A* (*i e*, toward the bivouac) Some of the returning ants in short processions are able to turn into principal trail *P* and force their way at least a short distance; however, most of them are diverted into branch *A* 1 or are detained at *A*, where a few huddled groups have formed.

4:30 p m —On principal trail *P* outgoing traffic now predominates all of the way to division *A*. The column is definitely wider past *A* than at 4·00, with few narrow stretches. Not many homegoers are to be seen other than an occasional short line of them which forces its way with difficulty at the margins of the trail. Callows are numerous in the wide procession almost to division *A*, although at first numbers of them emerging just after 4:00 were reversed by traffic impedances near the bivouac.

This wide column turns mainly into branch *A*-1 and dominates that trail for some distance beyond its source. At times a short procession turns at *A* from the exodus into branch *A*-2 and interrupts the movement toward *A* on this route However, traffic on

A-2 from its division *O* inward moves largely toward *A*, where it is swept almost entirely into branch *A*-1 by an evident pressure from the bivouac exodus A quick inspection of the outskirts shows that the two chief branches of *A*-2, trails *X* and *Y*, are feeding back a steady supply of returning foragers, with numerous booty-carriers among them

4·45 p m —At trail division *A* the wide procession now arrives steadily from the bivouac, with callows in large numbers as well as workers laden with *Eciton* larvae and miscellaneous booty (returned to the bivouac earlier in the day) Turning without much interruption directly into trail *A*-1, this stream loses very few strays to *A*-2, its mass now sweeping the *A*-2 homegoers more smoothly than before with it into *A*-1

5 15 p m.—On branch trail *A*-2 traffic moves predominantly inward toward junction *A*, fed especially from trail *X* which for the most part is undergoing evacuation However, on trail *Y* conditions grow in complexity toward the outskirts, with desultory raiding continuing at various trail ends, particularly in a small swarm at *Z* (This trail finally was the last of all to evacuate its population through route *A*-2 and junction *A* into the outward movement on route *A*-1)

5 45 p m —A wide column from the bivouac source flows unbrokenly through divison *A*, where it continues to drain ants from *A*-2 with it into trail *A*-1 Continuing as a broad procession past division *B*, the exodus there sweeps along in its mass an uneven file of evacuees from trail *B*-1, passing without any important interruptions into trail *B*-2, which it now clearly monopolizes. About midway between points *B* and *C*, however, the procession gradually narrows and begins to undergo interferences, with stoppages here and there resulting in clusters of ants with heaps of booty beside the trail. These conditions are mainly due to a narrow but steady procession which is evacuating branch trail *C*-1 to pass largely into trail *B*-2 and directly oppose the vanguard of the outward movement on that trail Ecitons from both *B*-2 and *C*-1 are entering branch *C*-2 in sufficient numbers to form a narrow column moving outward on that route, through a jungle in which (at 6 10 p. m.) they cannot be tracked.

6:25 p. m.—At this time the route of the bivouac-change movement, which is now well under way, may be readily traced from the bivouac through trail divisions *A* and *B*, and onward toward *C*.

(At 9·15 p m. the new bivouac was well formed under matted vines beside trail *B*-2 close to division *C*, with a wide column arriving from the old bivouac via *A* and *B*, a narrow column returning from trail *C*-2 partially laden with booty, and no trace of *C*-1)

This is the usual *burchelli* way of effecting a colony removal Gradually the exodus resulting from afternoon reactivation takes over the principal trail, although never without countless traffic interruptions and much confusion of movement, particularly at trail-division points. The general picture is one of complex interaction between an outward march from the bivouac and a movement of returning processions of raiders, with the latter giving ground and becoming reversed by degrees When the outgoing stream reaches the first main trail division in force, this becomes the scene of a see-saw movement which often persists for a considerable time before the procession can turn steadily into one branch or the other Thus it advances through the established trail system, with the certainty of further opposition of similar nature en route and at successive outlying forks of the trail

As a rule, once the exodus controls right-of-way at the first main trail divison (fig 2, *A*), a bivouac-change movement through the day's raiding system may be safely predicted However, when such dominance is strongly and consistently opposed, the final outcome may be very different from that described above as typical for *burchelli*.

7b. Conditions under which incoming traffic dominates the principal trail—In the critical afternoon period, the pressure of foragers returning from peripheral zones is not easily overcome in any case, and at certain times it may even remain dominant over the principal trail so that new behavior circumstances are introduced. These conditions arise when the raids are especially vigorous and well populated, with unusually large numbers of foragers remaining in the raiding system and subswarms through noontime Then an inward press of traffic toward the bivouac develops promptly with the afternoon reactivation and, if sufficiently heavy and persistent, it may force the outward movement into channels other than the principal trail of the established raiding system.

However, the exodus is not brought to an end even when inward pressure effectively opposes its discharge through the raiding system. Although not infrequently it may be stalled at the bivouac for some time by such opposition, it is only a matter of time before the outsurging forces take a different route. A case of this kind is represented in figure 3.

Actually, this phenomenon bears more than a chance resemblance to the initial formation of a raid in the morning. As more and more balked Ecitons retreat from the principal trail and further recruits stream from the bivouac, a confused

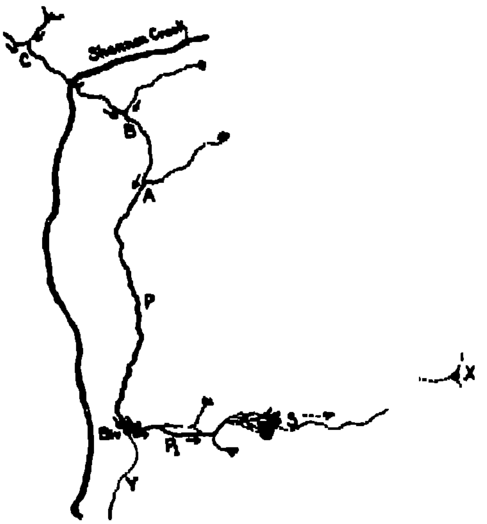

FIG. 3. A sketch to show conditions between 3 30 and 4·00 p. m in the exceptional case of a *burchelli* colony removal diverted forcibly from the day's raiding system (see text, sec 7b). *P*, principal trail of the day, *A*, *B*, and *C*, division points from which branches lead to main raiding places in a large tree, a thicket, and on a hillside (across Shannon Creek), respectively. The system, now reaching more than 130 meters from the bivouac (*Biv*), is undergoing general evacuation, as the arrows indicate. P_1, principal trail of the system newly developed in the afternoon resurgence; *S*, the advancing swarm, now more than 30 meters from the bivouac, *X*, a site about 90 meters from *Biv* where the colony will resettle during the night, *Y*, abandoned route of approach from bivouac of the preceding day. (*Cf* fig 2)

assemblage forms around the cluster, growing until it literally explodes into the environs in some new direction. Sometimes the new push starts as a radially surging mass which in time forms a directionalized swarm somewhat as in the early morning, although more rapidly; sometimes the ants push rapidly out in a wide pseudopodic column before a swarm takes shape Frequently, sufficient familiarity with earlier events may permit identifying the starting path as a trail end of the preceding day or a new route abandoned early on that same day (Schneirla, 1940: 412 ff, fig. 1-A.) The large numbers of recruits promptly available to this new pioneering foray account for a rapid progress once it begins to push out from the bivouac

With the new foray well under way, it is not long, as a rule, before its drainage effect exerted at the base of the bivouac causes foragers returning from the established raid to by-pass the bivouac and merge with this outgoing stream. In the course of time one observes that increasing numbers (both laden and unladen) returning from the raid are detoured past the home cluster in this manner The enlistment of returning Ecitons of course facilitates the development of the new movement considerably, by adding to the pressure and persistence of the exodus and thus opposing the disruptive influence of the inevitable return traffic Hence this event constitutes the recognizable beginning of a general evacuation of the day's raiding system, adding itself to the exodus from the bivouac so that the entire process of colony removal is noticeably hastened

However, on occasion the new push may dwindle away after a time as Ecitons are drawn off at the bivouac source into the regular raid, through some change which has reopened the established principal trail to outgoing traffic This may occur if an interruption on that route blocks off or reduces return traffic temporarily A cause sometimes observed is the rerouting of branch-trail traffic at the first trail division, through a special complication such as the rushing of ants from one branch into the other (*e g.*, as from branch *A*-2 into *A*-1, in the system of fig 2), which shuts returning ants off from the home route. The change may be set up experimentally by blocking off the returning foragers at a point between the bivouac and the first trail division, with a result similar to what occurs when the raid of another army ant colony chances to cut across the main *burchelli* route. Then, at the bivouac, numbers of ants promptly push into the cleared route; perhaps starting a movement which may continue into a colony removal on this line, in the manner described above (sec. 7a).

8. *Waning illumination and the abandonment of raiding* —Our distinction between the phenomena of raiding and bivouac-change is sharpened by the falling off of foraging which occurs regularly during late afternoon while colony removal continues. Beyond doubt the disappearance of predatory activities, rather precisely timed as it is, represents an important factor in furthering the general colony removal.

The nature of this major change in the day's behavior events is indicated by the following correlated records on raiding activities and available illumination during the latter part of the day,

TABLE 1

CONCURRENT RECORDS OF ILLUMINATION AND OF RAIDING ACTIVITIES IN A MAXIMALLY ACTIVE *E. burchelli* COLONY DURING LATE AFTERNOON, TAKEN JULY 19, 1938 (BARRO COLORADO ISLAND)*

TIME	LIGHT (IN FOOT CANDLES)	GENERAL BEHAVIOR
4:05 p. m.	48	During the past hour, three subswarms and various trail-end groups have been raiding vigorously. The largest raiding body at this time is 5 meters wide and is about 125 meters from the bivouac
4.30 p m	37	Two subswarms under observation steadily decrease in size, as indicated by narrowing of the groups and shortening of their consolidation fans. Sample traffic counts at intervals indicate an increase in the number of ants running on peripheral trails
4.50 p m	31	Further indications of decreased raiding
5·10 p m.	19	Raiding activity much less prominent The raiding bodies at trail ends are fast losing ants to the trails.
5:30 p. m	15	The subswarms have dwindled into small groups, the largest one now little more than 2 meters wide
5:50 p. m.	12	Little actual raiding can be detected, beyond a few small groups at trail ends. Traffic on most of the branch trails is now moving largely toward the trail junctions.
6:00 p. m	9	Few instances of raiding observable; peripheral trails all crowded. General movement on one main branch is outward, reversed by the basal bivouac-change movement This column ends in a small group of ants advancing rapidly
6:10 p. m.	6	
6:20 p m.	3	No instances of raiding seen Small groups at trail ends push outward, or move about circuitously with some huddling. All peripheral trails are undergoing evacuation, excepting two in the section toward which the bivouac-change movement is headed. The head of the wide outgoing column, now 60 meters from the bivouac, has forcibly reoriented traffic on these trails toward the periphery
6.28 p. m.	1.5	Conditions progress along the same lines. A few scattered instances of raiding are observed in the trail-end group advancing ahead of (*i. e.*, forced along by) the exodus.
6.32 p. m.	1.0	The bivouac-change movement has advanced nearly 70 meters from the bivouac, having gained full right-of-way through three division points of the principal trail. Within the first 40 meters from the bivouac the column, here 3–4 cm. wide, is crowded with callows. The surface of the bivouac is quiet, on the whole, with small groups of ants pulling at prey to be glimpsed here and there At three places irregular columns of Ecitons, laden predominantly with larvae, appear from beneath the undercut lower border of the cluster, to merge on one side into the wide outgoing procession. Within 2 meters of the bivouac there are groups of *burchelli* workers huddled at intervals beside the trail.
6 36 p m	0 5	In the outskirts of the raiding system booty-carriers are numerous in the columns, on which traffic is mainly drifting toward the bivouac-change route. No raiding activity can be discerned
6·44 p. m (Official sunset time)	0.0	The bivouac-change procession may be traced as a wide column for more than 75 meters from the bivouac.

* The readings of light intensity were made by Dr. Orlando Park, of Northwestern University, and are used here through his kindness. They were taken with a Macbeth illuminometer, the lowest scale-reading of which is 0 5 foot candles. Since the instrument was stationed near the bivouac where the forest was more open than in the advanced zone of raiding, the light readings run somewhat higher than they would have in the latter area at corresponding times.

The *burchelli* colony involved had carried out a bivouac-change movement on each of the two preceding days, and at the start of this record was beginning a further one after a day of maximal raiding.

These results indicate that the falling off in raiding activity commonly observable during the two hours preceding sunset occurs in dependence upon a progressive decrease in light intensity during that period. A virtually complete cessation of raiding at sundown, with swarm activities dropping out well before that time, occurs with a regularity which indicates that failing illumination is basically responsible for the change in behavior.[6] At dusk the ants just previously

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[6] Evidence from special tests indicates that light intensity is highly important as a control of diurnal activity changes in these ants. Colonies of *burchelli* in the laboratory become inactive soon after they are shielded from light, and promptly stir into activity each time they are exposed to light. In the forest, morning arousal to raiding depends upon light (Schneirla, 1940; 409 ff.). One may say that they are highly photokinetic.

Although atmospheric conditions cannot be excluded, there is no indication that they are essentially involved in engaged in predatory activities are virtually all in the moving columns, some of them huddled in small clusters at trail junctions, very few still raiding. From that time there occurs a slow evacuation of peripheral trails, a rather variable process based upon a gradual drainage of ants from these routes into the main bivouac-change movement (see sec. 7*a*, above) or toward the bivouac (see 7*b*, above).

The change no doubt is to some extent an indirect consequence of the decreased activities of other insects, affording less movement-stimulation to the hunters, however, *burchelli* ordinarily flushes most of its prey through its own activities, and foraging could not be stopped through this change alone. In the absence of light the marauders lose their daytime bustle and vigor, then they move lethargically, submitting rather passively to stimulation from their fellows, a change which soon brings the former raiders into column and channelizes their movements when under way. In the procession they seldom change places or move against the main stream of traffic, as frequently occurs in their daytime trail-following, but behave as though they occupied fixed places in line.

This is the way Ecitons characteristically move in column when extrinsic influences are reduced to matters of the chemical trail and the stimulative effect of fellow travellers immediately before and behind in the procession (Wheeler, 1910, Schneirla, 1940: 421 f.). They run in the same plodding monotonous gait when in circular columns set into motion on glass in the laboratory, a result readily obtained by causing Ecitons running over a table top to follow the edge of a glass battery jar which is then removed With the environment thus narrowed down, *burchelli* columns lose their variability of the day and merge their membership into a single massive pattern of movement.

Thus we find the disappearance of light to be a key factor contributing to the full development of colony removal in a regular, predictable manner. Its influence leaves the situation fully exposed to the already focalized outward pressure from the bivouac.

9. *The final stages of colony removal.*—By early evening the evacuative movement has become the chief activity of the colony. As newly involved colony members move from the cluster into the swollen procession, others are caused to move through the area of exit in a steady drift which presently brings them into the column in turn This translation of motion, effective throughout the bivouac and along the trails, is an inclusive illustration of *drainage* (Schneirla, 1938: 71 ff.; 1940). As such it depends upon the effects of chemically-saturated substratum and tactuo-chemical stimulation from nestmates roundabout. In this manner a continuous stream flows from the bivouac until the entire personnel of the colony (workers, ecitophiles, queen, and all) has become involved

Once on their way, the Ecitons move at a regular plodding pace, much slower and less variable than their daytime trail running. The monotony of their slogging progress is especially noticeable when larva-carriers throng the wide column, a condition especially promoting stereotypy of movement The consistent holding of relative positions in the procession, with the regular pace and the persistent rhythmic beating of forward-directed antennae, emphasize that to chemical stimulation from the trail strip itself is added an enveloping pattern of stimulation from those roundabout which orients each traveller and stereotypes her movements The uniform basis of stimulation through the column is indicated when a given section slackens pace momentarily in traversing a difficult stretch of ground (e.g., the rough bark of a log) and the change of motion is forecast perhaps half a meter before the obstruction is reached, or when a noticeable acceleration of pace occurs in nearing an easy stretch of trail along which ants ahead are moving more rapidly.

Much as the exodus generally comes to dominate the first principal trail division in late afternoon (see section 7*a*, above), the outward-moving stream subsequently reaches and forces its right-of-way through successive outlying forkings of the trail. At each newly encountered bifurcation, one alternative is taken over as an extension of the removal route, while traffic from the other branch is drained into the movement outward. After darkness finds raiding virtually at an end, the conflict of forces at newly involved trail-division points is more readily resolved than before. With nightfall the exodus advances irresistibly through outlying parts of the trail-system, not only because it presses strongly through all traffic impedances, but especially be-

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this particular behavior event. Concerning temperature, for example, on Barro Colorado Island during the month of July the representative change for the hour preceding sunset is less than 1.5° F, with a notable day-to-day variation and on some days an actual increase during this period.

cause such opposition has largely disappeared Gradually the scattered traffic lines and huddled groups are absorbed, either being drained into the outgoing procession through connecting channels or being forced to mingle as it pours through the trail segments.

Circumstances in the establishment of a new bivouac by *E burchelli* are much the same as those described for *E. hamatum* (Schneirla, 1933; 1938 · 74 f). The differences are secondary, and need not be discussed here Clustering begins at places such as advanced trail divisions where disoriented wanderers have halted after dark, or where special stoppages of traffic occur, continuing bivouac formation when conditions of this nature are exaggerated

SWARM RAIDS ENDING IN RETURN TO THE SAME BIVOUAC

The essential factors underlying colony removal in this species may be thrown into relief by surveying cases in which raiding is not followed by a movement from the area but by withdrawal of the raiders into the same bivouac. The conditions of external behavior are the main subject here, with the role of factors intrinsic to the colony reserved for study in a later connection

It will become apparent that the sequence of events when colony removal fails contrasts strikingly with that already outlined for raiding which is followed by a change of bivouac

Phases in the Development of Minimal Raiding

1. *The morning initiation of raiding* —*Burchelli* colonies commonly pass through periods of successive days when the general assemblage seems underactive, less responsive than ordinarily, and especially slow to be aroused in the morning. Although after daybreak some activity is perceptible on the bivouac surface, increasing in time, the radial invasions of the surrounding area with which raids ordinarily begin are slow to appear. An hour or more of daylight may elapse before many ants venture forth, and often one observes small groups eddying about on the ground even longer without noticeable developments. Under these conditions the formation of a unitary swarm, when this is accomplished, is much slower and less efficient than during nomadic times, when a directionalized foray usually may be recognized within the first hour after arousal (Schneirla, 1940: 409 ff.).

More striking is the fact that on occasion no foray may occur, perhaps for days, as Müller (1886) observed. It is even possible that no ants may appear on the ground, especially if the bivouac is well shielded from the light, as it is when the colony hangs within a hollow tree. Or a weak expansion may begin, without sufficient numbers to make a functioning swarm, and then gradually disintegrate as its personnel straggles back into the bivouac.

The impression gained from watching the successful development of many raids is that a given number of ants must be involved if a swarm is to take shape and get under way. When the numbers are insufficient and recruits slow to appear, the unorganized and scattered miscellany disappears after eddying about for a time at the base of the bivouac site That conditions intrinsic to the bivouac are at fault, and not extrinsic conditions such as booty supply in the area, is clearly indicated by frequent instances in which a colony, remaining in place for days, may develop no raid on the day another colony of the same species, bivouacked near by and comparably situated, produces a magnificent foray

These observations would lead one to expect that when raids do develop under such conditions, they must be subject to prevalent limitations That the raids of non-nomadic colonies are in fact considerably abbreviated is indicated by their smaller size and more limited scope of activities at given times of day in comparison with the energetic, more extensive raids of nomadic colonies. For instance, although at 11:00 a. m. the foray of a nomadic colony commonly presents a swarm exceeding 10 meters in frontal width, and one or more subswarms, at that time the swarm of a non-nomadic colony seldom exceeds half that size, and for the most part remains a unitary body. Circumstances all point to the conclusion that minimal raiding is a distinctive occurrence in colony life.

2 *A period of mixed traffic.*—It is interesting to note that traffic on the principal trail often reaches the confusion stage sooner under these conditions than when raiding is maximal. In the latter case outward traffic generally dominates until after 9:00 a. m., whereas in minimal raids not starting too slowly one frequently observes that return traffic has begun to introduce complications well before that time From the fact that smaller numbers of ants leave the bivouac, it is understandable that foragers can form a returning procession which disputes the

right-of-way sooner than in the large raids of a nomadic colony.

3. *A period of dominantly inbound traffic.*—Although general behavior changes are not highly predictable when raids are small, a swing of principal-trail traffic toward the bivouac generally is evident before 10:00 a. m. Traffic conditions thereafter are variable as a rule, with outgoing traffic continuing despite interference from the inbound procession.

Another sign of minimal raiding should be mentioned here. In the large raids which lead into bivouac change, the swarm typically becomes so unwieldy during the latter part of the morning that it divides into subswarms (Schneirla, 1940: 434 f.). In contrast, the definitely smaller forays occurring under non-nomadic conditions seldom exhibit swarm division, beyond a mere splitting away of minor groups raiding in restricted areas or in tangled vegetation.

4. *The "siesta" period.* The noontime depression, already described for other conditions, characteristically involves a marked reduction in the size and progress of raiding in non-nomadic colonies. Usually there is poor organization in the swarm and an uncertain advance. Traffic on the principal trail is predominantly directed toward the bivouac, from which few Ecitons take their departure. Huddled groups are to be seen here and there in the raiding area, particularly in places which are shaded and damp.

AFTERNOON EVENTS PRECEDING A GENERAL RETURN TO THE BIVOUAC—

5. *A limited afternoon resurgence.*—Although an early afternoon reactivation of the colony is not lacking even under these conditions of minimal responsiveness, observations indicate that it is low in strength. Generally before 2:00 p. m. there are signs of renewed activity at the bivouac and increased outward traffic on the principal trail; however, this movement is not sufficient in numbers and vigor to do more than increase somewhat the difficulties of travel. Despite the confusion which results from collisions among oppositely directed ants, virtually always the right-of-way remains with incoming traffic, so that outgoing travellers are forced to turn back or keep to the sides of the trail.

Although under these conditions the afternoon reactivation is a secondary matter, with little real significance for the terminal events of the day, nevertheless it is a significant fact that a rearousal of the colony does occur. Its appearance shows that under conditions effective in the rainy season the *burchelli* colony is regularly subjected to the action of excitatory influences after the lull of midday. A striking indication that these factors act specifically in early afternoon is the fact that raids may begin then, and normally only then, on days when no foray is established in the morning. It should also be noted that occasionally a raidless colony may show signs of activity after midday, even to the extent that groups begin to expand radially from the bivouac, without this leading to an effective swarm foray. It is evident that the early afternoon reactivation is a distinctive event, but that its influence upon colony behavior must depend upon further circumstances.

6. *Events preceding withdrawal to the bivouac.*—In non-nomadic colonies, although returning traffic often is sufficient to force back most of the outgoing travellers, this never leads to a persistent foray in a different direction from the bivouac. Such a new push may at times begin, however, it is always relatively weak and short-lived. Contrasting as it does with the behavior of a nomadic colony under these conditions, this result clearly indicates the relative weakness of the afternoon exodus in non-nomadic times.

There are no external influences playing an important part in this shortcoming. Usually in the first half of the afternoon no strong inward pressure exists on the principal trail, since foragers then returning do not form a continuous wide column. That outgoing traffic seldom strongly opposes the inward movement is indicated by the infrequency of "traffic jams" approaching the dimensions of those commonly observed at this time of day under nomadic conditions. The difficulty evidently rests with intrabivouac conditions.

These limitations are emphasized in cases when no foray whatever occurs until the early afternoon reactivation sets one off. Then, although the exodus has the exclusive right-of-way for a considerable time, it lacks persistence, and after an hour or two it has become overpowered by a return drift of laden and unladen raiders toward the bivouac. It is apparent that at such times the colony cannot be aroused thoroughly enough to maintain the outgoing movement as under nomadic conditions.

When the progressive failure of light in late afternoon acts upon the minimal raid of a non-nomadic colony, the impossibility of a bivouac-change movement becomes apparent. This change, crowding the trails with deserters from foraging, inevitably strengthens greatly the pressure from peripheral areas toward the bivouac. The basis is clear. Deprived of the quickening photokinetic effect, the now heavy-gaited Ecitons converge from their expanded trail-end groups into chemically saturated trails far more readily than they push into new terrain. To get the entire picture, we must add the facilitation of this homeward shifting of forces by a drainage *into* the bivouac, caused by ants remaining in the cluster once they reach it. It is as though a fluid were draining through an escape valve, creating a suction effect which accelerates the flow of remaining fluid toward the vent.

Thus the two influences, pressure from the periphery and drainage into the bivouac, supplement each other to bring about a predominant bivouac-ward shifting of forces throughout the trail system Finally the base trails, and especially the principal trail, become crowded with wide processions of Ecitons all slogging along in the same direction--at first sight resembling the bivouac-change movement of other times. However, this march may be distinguished from the other in its personnel workers intermediate for the most part with fewer majors, laden with booty and unladen—but without the intimate domestic signs of a true colony removal: the long lines of carriers burdened with Eciton larvae, the workers minor and the ecitophiles, and without the broad feverishly excited cortège which always surrounds and swarms over the *Eciton* queen as she pushes her way along toward the new bivouac somewhere near the end of the line.

SUMMARY AND DISCUSSION

The movement of an *Eciton* colony from one temporary nest to another we have called a "removal" or "bivouac-change movement." Anticipating a later discussion, we may say that the removal is to be considered not a true migration but rather a single section or phase of a migration —part of a more inclusive pattern of movement. Thus it is possible to agree with Heape (1931) to the extent that we recognize the *Eciton* removal as lacking the complete characteristics of a migration, yet to say that it contributes to a migration The judgment of Heape seems to have been unduly influenced by an apparent irregularity in the colony movements and by their assumed dependence upon food shortage for getting under way. Both of these impressions are very misleading, as our present study of how the individual movements originate has shown.

First of all, the colony-removal phenomenon must be distinguished from regular predatory expeditions. The two activities occur under different conditions, and differ distinctively in their behavior properties. Although, as Müller (1886) observed, foraging in *burchelli* is a daytime activity, the colony removal follows the raid and thus occurs in the evening and night. However, a colony removal is not the inevitable sequel to a raid, since frequently, as in *hamatum*, a foray may end in a general return to the same bivouac site

Yet the fact that in both of these *Eciton* species the colony removal follows a daytime predatory expedition, appearing gradually with increasing clarity as raiding disappears, speaks for the existence of a close relationship between the two phenomena. Our investigation of this relationship has disclosed that in a number of ways the *burchelli* swarm raid is prerequisite to the development of a bivouac-change movement. The causes of raiding thus serve indirectly as instigators of the subsequent colony removal.

The development of the *burchelli* raid as a process leading to colony removal involves a rather unique routine demanding analysis in its own terms, as distinct from the pattern of events in the column-raiding species *E. hamatum*. In the *burchelli* swarm raid, the light-aroused morning exodus expands into just one major raiding system, contrasting with three in the maximal *hamatum* raid, which offers a distinctly different basis for a bivouac-change movement. On the single trunk route which remains as the *burchelli* foray advances, connecting the main raid with the bivouac, there occurs through the day a sequence of mass behavior changes which we have found essential as a basis for the colony removal. Without the raid, the removal could not occur.

The diurnal regularity of raiding and colony removal characterising the terrestrial species *burchelli* and *hamatum* is clearly dependent upon an extrinsic factor: timing of the raids by daylight. However, we have seen that not all forays can pass over into colony removal—only those which reach a state of development indicated by our term *maximal raiding*. Others, less extensively developed, can be followed only by a withdrawal of the predatory expedition to its starting-point. In separate sections of this report it has been shown that the behavior patterns of maximal and minimal raiding may be readily distinguished, although certain basic events are common to both. For maximal raiding to occur, the colony must be highly responsive to extrinsic influences (such as the coming of daylight, and atmospheric changes in early afternoon). There are many indications that this susceptibility to outer conditions depends upon the internal situation of the colony at the time, a matter so independent of the booty supply available in the given area that it is highly misleading to cite the latter as an essential *cause* of colony removal.

Clearly it is not simply an exodus from the bivouac that leads into colony removal, but an exodus under given conditions. The *morning* exodus at times of maximal raiding probably involves more than half of the colony's worker population, yet it never passes over directly into a bivouac-change movement. One reason is that the outpouring Ecitons are readily absorbed into expanding a fresh raiding system; another is that environmental conditions (such as light, and insect commotion) elicit a variety of energetic responses scarcely admitting the highly uniform trail-following essential to actual colony removal. Also in all probability the exodus is somewhat inhibited in time by a vigorous return traffic, yet traffic interference alone could not halt the outward movement completely. If the outpouring continued in force, it could, when largely blocked from the principal trail, expand from the bivouac in another direction, as sometimes occurs in the afternoon. Instead, there are indications that recruits are held at the source, within the bivouac itself, where responses to returned booty (*e. g.*, the further division of large pieces) divert many workers already well aroused and capable of joining the foray. The gist of the matter is that the morning exodus does not continue persistently as in the afternoon, because it becomes largely redirected and absorbed into other activities.

The highly predictable ordering of events in the *burchelli* raid is impressive. The massive egress of early morning is followed by a swing of traffic from the heavily populated foray toward the bivouac; then at midday there occurs a marked reduction of activity throughout the raiding situation—a highly regular succession of changes. The characteristic lull in activities, the "siesta" period, which follows at midday seemingly in response to extrinsic changes then arising, is critically important since it sets the stage for the coming of a new train of behavior events.[7] By lethargizing the Ecitons directly, as well as indirectly through reducing movement-stimulation from small forest fauna, these environmental changes (very possibly atmospheric changes) of noontide play a key role in leading to further developments essential for the eventual colony removal.

The midday depression of activity is succeeded by a revitalization of the *burchelli* colony, presumably when the extrinsic factors responsible for this condition have waned somewhat. Day after day the early afternoon brings a revival of activity which is thoroughgoing and persistent. This of course does not mean that the ants are aroused from a state of complete quiescence; rather it is a matter of recovering from a temporary low point of general activity. Actually, Ecitons in daytime seem constantly in motion (Wheeler, 1900), and even workers hooked into the bivouac fabric exhibit an incessant agitation of oscillating antennae and shifting foreparts which gives the surface of the cluster "the appearance of the fur of some terrible animal" (Beebe, 1917).

There is little doubt that the afternoon reactivation is an event regularly stimulated by extrinsic changes peculiar to the time of day, since it appears even in minimally active colonies which are not migratory at the time.[8] Often in such instances it produces the first sortie of the day. However, the fact that in such cases the afternoon resurgence is not followed by a bivouac-change movement, suggests that an intrinsic condition essential to this development is then lacking in the colony When raiding is maximal, the reactivation is impressive for its persistence, and once under way it can end only in a colony removal.

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[7] In view of its strategic importance for the *burchelli* colony removal, the lack of direct evidence on the basis of the "siesta" period is regrettable. Because of the known relationships between temperature and insect activities (Uvarov, 1931) and because of the characteristic tropical midday rise in temperature, one thinks first of that factor. Yet near the forest floor, with the exception of sun-fleck areas, the noontime temperature increase is relatively small (Kenoyer, 1929), seemingly insufficient to produce alone the striking behavior changes which occur. The possibility that other atmospheric conditions may be involved and that an inhibitory effect of (relatively) intense illumination may occur, cannot be overlooked. To the writer's knowledge this characteristic change in the activity of tropical-forest animals at midday remains an unexplored problem well meriting systematic ecological and behavior study.

[8] It is conceivable that the rearousal is to some extent similar to the phenomenon known as "temporal memory," which has been demonstrated in the honeybee and in certain ants (Grabensberger, 1933), in which a conditioned excitation, considered by many to be intraorganic and independent of extrinsic stimulation (v Stein-Beling, 1935), excites foraging at the time of day of previous feedings. The point is somewhat doubtful for the Ecitons, however, since captive *burchelli* and *hamatum* colonies under ruby glass in the laboratory do not exhibit any noticeable increase in activity in the afternoon at the time when there is a resurgence of activity in colonies free in the forest.

During the season of rains in the Caribbean forest of Panama, afternoon downpours are fairly regular occurrences This of course means considerable interference with *Eciton* raids, yet the completion of the described diurnal routine is seldom prevented. A torrential downpour can retard a *burchelli* foray materially by forcing raiders under cover and holding others in the bivouac, but once the rain abates the raiding system promptly stirs into action (Beebe, 1919), while the steady column soon issuing from the bivouac indicates the turbulent state which must have persisted therein.

In one sense the extrinsic influences which arouse the afternoon resurgence may be considered equivalent to the action of morning light which initiates the day's raid However, the outcome of the two stimulative phenomena is very different, since the outpouring Ecitons encounter very different environmental situations in the two cases. In the afternoon the new exodus enters a raiding system already developed, through which it is channelized without being diverted into trail-making and predatory activities near the bivouac. In contrast, the vigorous outburst of the morning is largely discharged into such pioneering behavior Moreover, as we have pointed out, the morning exodus is impeded by booty-carriers near the bivouac and its energy is sapped by atmospheric changes at midday Hence the morning arousal leads to the growth of a raid, while that of afternoon can lead to a complete shift of the colony provided that the colony's "threshold of arousal" is adequate.

The critical importance of the excitability threshold of the colony is revealed in the outcome of the conflicts between outgoing and return traffic on the principal trail. Such conflicts develop both in the morning and in the afternoon, with tactual friction as well as bodily collision between oppositely travelling Ecitons, so that the issue generally depends upon the greater numbers and the persistence of one of the columns. Under non-nomadic conditions, the relative weakness of the exodus (and the corresponding low point of colony arousal) is indicated by the readiness with which return traffic dominates it. In contrast, when the colony is nomadic, the great strength of the morning exodus reveals itself in the duration and the high pitch of traffic conflict, and that of the afternoon exodus in the fact that it typically imposes a lasting reorientation upon the returning column. Hence the *burchelli* colony removal typically passes through the established raiding system

Even when return traffic in an unusually well-developed raid effectively monopolizes the trunk route, the afternoon exodus is sufficiently vigorous to push out from the bivouac in a different direction, starting along a short route abandoned early in the day The colony movement then develops along these lines. In contrast, when in non-nomadic times the exodus of the afternoon is similarly blocked, there is seldom a new advance from the bivouac, and when one occurs it is not persistent These very different outcomes disclose the critical importance of intracolony circumstances for the phenomenon of removal.

We are reminded here of the striking difference between *hamatum* and *burchelli* in the pattern of raiding which precedes colony removal. In *hamatum* the afternoon exodus can discharge from the bivouac into a second or a third alternative route if the one first hit upon is blocked; whereas the *burchelli* exodus meets but one well-formed route as a rule, and if this be obstructed by counter-traffic, the only alternative is a virtually new path. However, this handicap is offset by the typical *burchelli* procedure of advancing en masse without the frequent subdivisions of pioneer groups observed in *hamatum*. Thus, although *burchelli* evolution has produced a mechanism of raiding which channelizes the avenue of bivouac change much more rigidly than in *hamatum*, when this leads to special difficulties an adaptation is available through the same species capacity for mass advance.

When *Eciton* species with rather different foraging patterns both pass from raiding into bivouac-change behavior, we are led to look for essential common factors underlying the patterns. *E. hamatum* with its multiple trunk routes can shift readily among them for the bivouac change; *burchelli* lacks well-formed alternative routes, but adjusts efficiently to blocking through its mode of concentrated group locomotion. The given pattern of organization of predatory expeditions seems to be a secondary matter for the *Eciton* colony removal, so long as a species establishes at least one saturated route from the bivouac. The essential *anlage* of the bivouac-change phenomenon, in these terrestrial species and probably also in others, thus arises through the foraging expedition. Another prerequisite common factor is the capacity for afternoon re-arousal following a "siesta" period. This matter calls for further consideration.

When the characteristics of minimal raiding are recognized in a colony of either *burchelli* or *hamatum*, it is safe to predict that no transition from raiding into bivouac change will occur. An undersized swarm, failure of major swarm division, a smaller perimeter of raiding—all are signs of this condition in *burchelli*. When the morning raid is underdeveloped or does not materialize, the afternoon rearousal also is relatively weak—then no removal is possible. This condition is not dependent upon environmental circumstances, since colonies operating in the same general area may differ widely in their raiding and capacity for bivouac change under closely similar extrinsic conditions. The essential foundation evidently lies in intrinsic conditions determining colony responsiveness, the ebbing of which at a given time restricts the development of raiding and thereby holds the colony to the spot.

This brings us to the conclusion that colony removal is to be considered an extension of raiding under appropriate conditions. However, to round out the theory we must consider a further extrinsic factor which permits well-developed raids to be transformed into bivouac changes and poorly developed raids to be reabsorbed without a colony removal. This influence is the regular afternoon decrease in light intensity. As morning light times the beginning of a raid, dusk times its end. The change in light is gradual, hence the falling away of raiding activity for which it accounts is also gradual. The effective environment then is greatly simplified, its stimulative role monotonous, and the *Eciton* response is an automatized process of stolid trail-running. As raiding progressively declines, new possibilities in general behavior are admitted as the travellers submit with increasing readiness to whatever traffic drift happens to predominate.

Whether this drift is a pressure away from the bivouac or a movement toward the bivouac, depends basically upon intrinsic conditions in the colony. With colony responsiveness at its ebb, the afternoon exodus is relatively weak, and a homeward drift prevails at dusk, when colony responsiveness is high, the exodus persists strongly, blocking the homeward movement as a rule and shunting the Ecitons from raiding into a general outgoing movement. Thus in the *burchelli* pattern of events there are unmistakable signs of an underlying causal interaction between certain crucial extrinsic factors and intrinsic conditions prevailing in the colony at a given time.

The role of the extrinsic factors is responsible for the striking regularity and predictability of the raiding and bivouac-change phenomena as diurnal occurrences. Particularly important at successive stages of the routine we have found the coming of sunrise, the atmospheric changes of midday, and the effect of dusk. The influence of illumination strikingly illustrates the adaptive significance of these extrinsic regulative factors, for although light has no important orienting function in the field activities of either *burchelli* or *hamatum*, the outstanding photokinesis of both species is a matter of critical importance for the timing of raids and hence for the timing of bivouac-change movements. Such facts reveal a highly adaptive interaction of environmental periodicity with *Eciton* characteristics which indicates the phylogenetic stability of the entire phenomenon.

Despite the prominent influence of extrinsic factors in the pattern of events, the key to the nomad aspect of *Eciton* life rests with intrinsic conditions, since only in a sufficiently responsive colony can the essential conditions of colony removal arise. The solution of the problem of nomadic behavior in *burchelli* thus seems to lie in a closely organized interaction between the sequence of processes in maximal raiding and the "explosive" characteristics of a maximally excitable colony.

Notwithstanding the closeness of the discovered relationship between raiding forays and colony removal in the investigated Ecitons, the factors governing nomadic behavior or its absence do not seem dependent in any identifiable way upon food supply in the area occupied at a given time. Besides our other facts, doubt is cast upon the possibility of a food-supply influence by the frequent observation that a colony may remain for a considerable time in an area just vacated by another colony after a single day's tenancy. Repeatedly confirmed, this observation constitutes a natural control experiment excluding the assumed teleological process as unfounded.

For although the food-supply hypothesis has a wide acceptance in the doryline literature and may seem plausible as a direct inference from teleological conceptions of social behavior in insects, it has no real factual basis. None of the authors advancing this hypothesis to account for doryline nomadism has been able to show what demonstrable behavior processes might give it validity

In one or two instances one can readily discern what has misled observers into adopting this telic hypothesis. Vosseler (1905), for example, passes from a consideration of trail abandonment in raiding to the seemingly justifiable inference that a colony whose raiding columns withdraw from places where booty is sparse may on the same basis move as a whole from worked-out nesting areas. At first sight, the point may seem plausible, yet in no sense does it follow.

The distinction we have been able to draw between raiding and colony removal calls attention to the fact that these two cases of *Eciton* evacuation of an area, the minor and the major, occur under very different conditions. On the one hand, during a raid the amount of booty discovered on a given branch trail typically affects the life of that trail in a rather direct manner, through behavior processes subject to a simple naturalistic explanation (Schneirla, 1940: 437 ff.). However, we have found that the occurrence of a colony removal from a given general zone of operations depends upon a complex train of events very different from the foregoing, involving activities and relationships which operate without any identifiable relation to the amount of booty available in the area. In fact, such a relationship is commonly contradicted by prevailing circumstances. The removal may take the colony from a well-supplied area or from a poor one—it occurs in any case when the conditions we have described, not dependent upon booty haul, are fulfilled. The food-scarcity hypothesis is wide of the mark, and actually misrepresents the demonstrable facts of the bivouac-change phenomenon

From his survey of the general problem of insect migration Fraenkel (1932) reaches a comparable conclusion Examining the evidence for the mass movements of locusts, butterflies, and various other insects, he finds that lack of food can at best be only a very indirect and secondary cause of insect migration—that is, lack of food operates selectively in the evolutionary process rather than directly and ontogenetically. Although Fraenkel expresses doubts as to the status of Ecitons as true migrants, it may be said that his remarks concerning the inadequacy of this telic hypothesis also cover the case of army ants.

We have noted the exclusion of the Ecitons by Fraenkel and Heape from the list of migrant insects, because of doubts that their movements represent anything more than foraging expeditions. Both of these writers seem to have been impressed by the apparent sporadic nature of *Eciton* colony movements. However, our evidence on colony removals in *burchelli* and *hamatum* shows that these are true nomadic movements and not merely expeditions, if the latter term means simply predatory forays. The term "expedition" may be used for raids which end in a return to the same bivouac; however, it does not apply to the bivouac-change movements, which are readily distinguishable from raiding activity The facts show that these removals follow raiding in a predictable manner under given conditions, but not under other conditions. Although we have found that the bivouac-change movement arises through behavior relationships which come into existence through the development of maximal raiding, in its behavior properties and its adaptive significance it is a distinct phenomenon not to be confused with raiding.

How far and in what ways the described *Eciton* colony movements fit current conceptions of animal migration is not an easy question, because of their unique characteristics. To be sure, many general observers have referred to doryline bivouac changes as migrations. This seems not unjustified, since our evidence shows that the movements are periodic, (roughly) unidirectional, dependent upon the activity of the Ecitons themselves, and take the colony away from its previous zone of operations—all characteristics which Cahn (1925) and others hold to be the essential criteria of migration. From this viewpoint daily movements such as the individual bivouac changes of an *Eciton* colony would be classed as migrations. To follow this procedure would be premature, however, and would commit us to an unduly loose construction of the migration concept, of questionable scientific value since it excludes the question of broader relationships between the movements and the life activities of the animals. Further circumstances in *burchelli*, together with evidence previously reported (Schneirla, 1938) for *hamatum*, encourage viewing the bivouac-change movement as merely one phase of a broader unitary sequence of activities.

Accordingly, the descriptive term "removal" seems adequate to denote such movements taken separately.

The present study has widened the writer's theory of the *Eciton* behavior pattern by showing its applicability to a rather different behavior setting from that of the species previously studied The colony movements of *burchelli* arise from a distinctive routine of predatory behavior, yet the manner in which they take form agrees well in its broad outlines with the explanation previously advanced for *hamatum*. In both cases the interaction of extrinsic and intrinsic agencies leads in an equivalent way to similar end results, although through a strikingly different mechanism. This effective similarity in the process of nomadic movement in the two species, despite a striking difference in the pattern of their raiding behavior, suggests that the essentials of the theory may well hold for the Ecitons in general.

CONCLUSIONS

1. Colony removal in the swarm-raiding *E. burchelli* conforms in its causation to the terms of the writer's theory for the column-raiding *E hamatum*.

2. Certain extrinsic conditions are essential, including given behavior circumstances arising through raiding. The critical factor for bivouac change is an intrinsic condition introducing a sufficiently low threshold of colony excitation to admit a given diurnally timed routine of events.

3. The detailed mechanism of colony removal in *burchelli* is characteristic of that species, in dependence upon its swarm-raiding behavior pattern.

4. There are no grounds in the evidence for the hypothesis that doryline nomadism depends upon a capacity to respond to food scarcity in a given occupied area.

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INDEX TO VOLUME 87

America enters the scene (Ford), 121
American Georgian architecture (Wertenbaker), 65
American historiography a critical analysis and a program (Shryock), 35
American painters in England, Early (Mayor), 105
American Philosophical Society, The beginnings of the (Van Doren), 277
  Education and the (Odgers), 12
  Jefferson and the (Chinard), 263
  and the world of science (1768-1800) (Chinard), 1
American studies of Mediterranean archaeology, Early (Dinsmoor), 70
American work in linguistics, Notes on early (Edgerton), 25
Anthropology, physical, in the United States of America (Hrdlička), 61
Archaeology, Early American studies of Mediterranean (Dinsmoor), 70
Architecture, American Georgian (Wertenbaker), 65
Army-ant behavior pattern, Studies on the (Schneirla), 438
Artifacts, human, associated with fossil mammals in North America (Montagu and Peterson), 407
Arts and letters, Scholarship in (Nicolson), 352

Becker, Carl, What is still living in the political philosophy of Thomas Jefferson?, 201
Betts, Edwin M., The correspondence between Constantine Samuel Rafinesque and Thomas Jefferson, 368
Biological phenomena, The discovery and interpretation of (Bronk), 307
Boas, Franz, Individual, family, population, and race, 161
Botany, Rafinesque's publications from the standpoint of world (Merrill), 110
Boudreau, Frank G., Social and economic implications of freedom from want of food, 126
Boyd, Julian P., Horatio Gates Spafford, precursor of Bessemer, 47
Bronk, Detlev W., The discovery and interpretation of biological phenomena, 307

Chinard, Gilbert, The American Philosophical Society and the world of science (1768-1800), 1
  Jefferson and the American Philosophical Society, 263
Choptank Indian chief, Wynicaco—a (Weslager), 398
Conant, James B., The advancement of learning in the United States in the post-war world, 291
Conklin, Edwin G., Introduction to the Jefferson bicentennial program, 199
Copernican Revolution, The philosophical meaning of the (Frank), 381
Chromatophore responses, The time factor in (Parker), 429

Daniel Boone farm, Ben Franklin's mortgage on the (Nolan), 394
Darrow, Karl K., Entropy, 365
  Discussion on the symposium "Organization, direction, and support of research," 321
Dickinson, John, The old political philosophy and the new, 246
Dinsmoor, William B., Early American studies of Mediterranean archaeology, 70
Du Noüy, P. Lecomte, Physiological time, 435
Dutilly, Arthème, An inexhaustible source of linguistic knowledge, 403

Eciton burchelli, Nomadism in the swarm-raider (Schneirla), 438
Economics of transition (Loveday), 189
Edgerton, Franklin, Notes on early American work in linguistics, 25
Education and the American Philosophical Society (Odgers), 12
England, Early American painters in (Mayor), 105
Entropy (Darrow), 365
Europe, post-war, Some implications of population change for (Notestein), 165

Family, population, and race, Individual, (Boas), 161
Fetter, Frank A., The early history of political economy in the United States, 51
Food, Social and economic implications of freedom from want of (Boudreau), 126
Ford, Guy Stanton, America enters the scene, 121
Fossil mammals in North America, association of human artifacts with (Montagu and Peterson), 407
Frank, Philipp, The philosophical meaning of the Copernican Revolution, 381
Franklin's, Ben, mortgage on the Daniel Boone farm (Nolan), 394
French refugees of 1793 in Pennsylvania (Murray), 387

Gregg, Alan, A critique of medical research, 313

Halecki, Oskar, The problem of self-determinism, 194
Historiography, American a critical analysis and a program (Shryock), 35
Historiography, War and (Schuyler), 342
Hrdlička, Aleš, Contribution to the history of physical anthropology in the United States of America, 61

Indian chief, Wynicaco—a Choptank (Weslager), 398
Individual, family, population, and race (Boas), 161
Innis, Harold A., Political economy in the modern state, 123

Jefferson, Thomas, bicentennial of, 199-289
  Correspondence between Constantine Samuel Rafinesque and (Betts), 368
Johnson, Emory R., Panama Canal revenues and finances, 175

Kimball, Fiske, Jefferson and the arts, 238
Koht, Halvdan, The small nations in the post-war world, 182

Levi, Doro, The novel of Ninus and Semiramis, 420
Linguistic knowledge, An inexhaustible source of (Dutilly), 403
Linguistics, Notes on early American work in (Edgerton), 25
Loudon, Alexander, Some thoughts on post-war planning, 139
Loveday, Alexander, The economics of transition, 189

Mammals, fossil, association of human artifacts with, in North America (Montagu and Peterson), 407
Mayor, A Hyatt, Early American painters in England, 105
Medical research, A critique of (Gregg), 313
Mediterranean archaeology, Early American studies of (Dinsmoor), 70
Merrill, E D, Rafinesque's publications from the standpoint of world botany, 110
Monetary stabilization, Problems of post-war international (Williams), 133
Money and sovereignty (Warren), 147
Montagu, M F Ashley, and C Bernard Peterson, The earliest account of the association of human artifacts with fossil mammals in North America, 407
Morris, Roland S, Jefferson as a lawyer, 211
Murray, Elsie, French refugees of 1793 in Pennsylvania, 387

Nichols, Roy F, War and research in social science, 361
Nicolson, Marjorie H, Merchants of light scholarship in arts and letters, 352
Ninus and Semiramis, The novel of (Levi), 420
Nolan, J Bennett, Ben Franklin's mortgage on the Daniel Boone farm, 394
North America, association of human artifacts with fossil mammals in (Montagu and Peterson), 407
Notestein, Frank W, Some implications of population change for post-war Europe, 165

Odgers, Merle M, Education and the American Philosophical Society, 12

Painters, Early American, in England (Mayor), 105
Panama Canal revenues and finances (Johnson), 175
Parker, G H., The time factor in chromatophore responses, 429
Peterson, C Bernard (with M F Ashley Montagu, *see* Montagu)
Philosophy, political, The old, and the new (Dickinson), 246
  of Thomas Jefferson (Becker), 201
Physical sciences, The organization, direction, and support of research in the (Taylor), 299
Physiological time (P Lecomte du Nouy), 435
Political economy in the modern state (Innis), 323
  in the United States, The early history of (Fetter), 51
Population change for post-war Europe, Some implications of (Notestein), 165
Population, and race, Individual, family, (Boas), 161
Post-war problems, 121–198

Race, Individual, family, population, and (Boas), 161
Rafinesque, Constantine Samuel, and Thomas Jefferson, The correspondence between (Betts), 368
Rafinesque's publications from the standpoint of world botany (Merrill), 110
Research, Symposium on the organization, direction, and support of, 291–364
Research in social science, War and (Nichols), 361

Schneirla, T C. Studies on the army-ant behavior pattern—Nomadism in the swarm-raider *Eciton burchelli*, 438
Self-determinism, The problem of (Halecki), 194
Schuyler, Robert Livingston, War and historiography, 342
Semiramis, The novel of Ninus and (Levi), 420
Shapley, Harlow, Notes on Thomas Jefferson as a natural philosopher, 234
Shryock, Richard H, American historiography: a critical analysis and a program, 35
Social science, War and research in (Nichols), 361
Sovereignty, Money and (Warren), 147
Spafford, Horatio Gates, precursor of Bessemer (Boyd), 47

Taylor, Hugh S., The organization, direction, and support of research in the physical sciences, 299
Time, Physiological (Du Nouy), 435

United States, The early history of political economy in the (Fetter), 51
United States in the post-war world, The advancement of learning in the (Conant), 291
United States of America, physical anthropology in the (Hrdlička), 61

Van Doren, Carl, The beginnings of the American Philosophical Society, 277

War and historiography (Schuyler), 342
War and research in social science (Nichols), 361
Warren, Robert B, Money and sovereignty, 147
Wertenbaker, Thomas Jefferson, American Georgian architecture, 65
Weslager, C A, Wynicaco—a Choptank Indian chief, 398
Williams, John H, Problems of post-war international monetary stabilization, 133
Wilson, M L, Thomas Jefferson—farmer, 216
Wright, Louis B, Thomas Jefferson and the classics, 223
Wynicaco—a Choptank Indian chief (Weslager), 398

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